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Timber Management and Forest Fire Protection Costs in Montana

Report and Recommendations of Joint Interim Subcommittee No. 2 to the 49th Legislature

December 1984

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TIMBER MANAGEMENT
AND
FOREST FIRE PROTECTION
COSTS IN MONTANA

REPORT AND RECOMMENDATIONS
OF
JOINT INTERIM SUBCOMMITTEE NO. 2
TO
THE 49TH LEGISLATURE

Required by
House Joint Resolution 40
48th Legislature

October 1984

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SUMMARY OF RECOMMENDATIONS

(1) The phased program of equalization of fire protection responsibility on forest lands be continued with the Department of State Lands assuming responsibility for the White Sulphur Springs Block during the 1986-87 biennium.

(2) The minimum fee to be charged private landowners for fire protection on classified forest land be increased from $6 to $30 per year while per-acre charge remains at 16 cents, provided the minimum will be raised in stages as necessary and that the total assessments on private property not exceed one-third of the total appropriated by the Legislature for forest fire protection.

(3) The annual appropriation be increased by $315,000 from the general fund and $540,000 from the earmarked revenue fund to increase the annual timber harvest from state forests by 15,000,000 board feet and to increase the income to the permanent school trust fund by $1,125,000 a year.

ORIGIN OF STUDY

House Joint Resolution No. 40 was approved by the 48th Legislature with third reading votes of 90-3 in the House and 46-4 in the Senate. The principal sponsor of the measure was Representative Chris Stobie, who sought an interim study to inquire into the management of state forest lands and the costs of protecting forests against fire.

Recognizing that the activities of the professionals in the Division of Forestry are restricted by budgetary limitations, Representative Stobie cited the successful efforts of private industry in timber stand improvement through utilization of information derived from continuing research into forestry practices. An objective, he said, should be ultimately to return more money to the state through improved management techniques. To achieve this objective, he asked consideration of various options for appropriation of funds to determine the most productive use of available money.

A second subject calling for thorough study was the protection of forests from the ravages of fire. The announced intention of the U.S. Forest Service to impose full costs for fire protection--which could mean quadrupling the charge to the state for the imbalance of forest land under state and federal protection--makes it imperative that the state take action to protect itself against this sudden escalation. Representative Stobie expressed his support of the state assuming the role of fire protector. In this role, the state could assure Montanans first opportunity at any employment created

in the prevention, control, and suppression of forest fires.

Responsibility for the inquiry into these subjects was assigned by the Legislative Council to Interim Joint Subcommittee No. 2.

MONTANA'S STATE LANDS

Under the direct administration of the Department of State Lands (DSL) are approximately 5.1 million acres of trust land. The law mandates management under the multiple use principle which requires that the attributes of the land be utilized in the combination that best meets the needs of the people and the beneficiaries of the trust.

Montana law (Section 77-1-401, MCA) classifies state land into the following categories, according to its uses:

> Class 1, lands which are principally valuable for grazing purposes.
>
> Class 2, lands which are principally valuable for the timber that is on them or for the growing of timber or for watershed protection.
>
> Class 3, lands which are principally valuable for the production of crops.
>
> Class 4, lands which are principally valuable for other uses.

At the subcommittee's organizational meeting, members decided by a vote of 5-3 (Senator Conover and Representatives Ream and Jensen voting no) that attention should focus on forest lands without consideration of the management of or revenue from other classes of land.

Montana's state-owned lands include both trust lands and fee lands. Trust lands are those granted by the United States government to support schools and land grant institutions and managed by DSL. Fee lands are those acquired by state agencies for any of a variety of uses ranging from fishing access to highway right-of-way and managed by the acquiring agency.

Sections 16 and 36 in each township were granted by Congress under the Enabling Act of 1889 for support of common schools. Land to support other educational and state institutions was granted by the Enabling Act and later legislation. Sections 16 and 36 are still generally recognizable as school lands although some modifications and consolidations of this pattern have occurred as compensation for the withholding of those sections in certain localities such as on some of the Indian reservations and in national parks and national forests.

Grazing and agricultural trust land has been administered by the Department of State Lands since that agency's creation in 1927.

State forests were managed by the Department of Natural Resources and Conservation (DNRC) and its predecessor agencies until the transfer of the function to DSL on July 1, 1981.

DSL is headed by the Board of Land Commissioners, a constitutional body composed of the governor, the superintendent of public instruction, the state auditor, the secretary of state, and the attorney general which meets monthly. The chief administrative officer of DSL is the commissioner of state lands, who

serves by gubernatorial appointment subject to Senate confirmation.

The state forests are supervised by the Division of Forestry, officed in Missoula and headed by the administrator, who carries the traditional title of State Forester.

TIMBER RESOURCES

The State of Montana owns about 491,000 acres of forest land of which about 203,000 acres are included in seven designated state forests:

-- Stillwater State Forest, about 90,000 acres situated in the Stillwater and Whitefish Rivers' drainages in Flathead and Lincoln Counties.

-- Swan River State Forest, about 42,000 acres situated in the Swan River watershed of Lake County.

-- Coal Creek State Forest, about 20,000 acres situated in the Coal Creek watershed of the North Fork of the Flathead River in Flathead County.

-- Sula State Forest, about 10,000 acres situated in the Camp and Cameron Creeks' watersheds of Ross Hole in Ravalli County.

-- Thompson River State Forest, about 14,600 acres situated in the Thompson River watershed of Sanders County.

-- Clearwater State Forest, about 18,000 acres situated in the Clearwater River watershed of Missoula County.

-- Lincoln State Forest, about 8,200 acres situated in the Blackfoot River watershed of Lewis and Clark County.

During the 1967-68 interim, a 16-member committee appointed by Governor Tim Babcock undertook a study of the diversified uses of state-owned lands. As a result of this study, the Forestry Division got much broader responsibility in fire prevention and control, and public accessibility to state lands for recreation purposes was increased.

During the first 40 years of statehood, Montana was emerging from its frontier stage, and population pressure did not create heavy demand for alternative use on state lands. By the mid-1920s, however, most of the available land had been settled and it became apparent that the state needed to protect its holdings. In 1925 the legislature established the seven state forests to assure a continuous supply of timber and to preserve watershed cover. The sale of lands classified as timber lands was forbidden in 1927, and a strip of land 100 feet wide bordering certain streams and lakes was reserved from sale for the use and enjoyment of the public. The Land Board's power was broadened to recognize other public values by providing that lands "are held in trust for the support of education <u>and for the attainment of other worthy objects helpful to the well being of the people...</u>"

The report of the 1968 study committee propounded a fundamental conclusion that diversified uses of state land, particularly recreational use, is practical only if the State of Montana assumes a direct obligation in the management and protection of those lands. A specific recommendation was that the State of Montana assume direct responsibility for protection of all state-owned lands from destructive fires started by any cause and that the protection be provided through an

expansion of the existing facilities complemented by a cooperative program with the counties, conservation districts, rural fire departments, and others.

From this recommendation grew a statewide firefighting organization with trained personnel, equipment caches, and motorized equipment, much of which was obtained at little or no cost from federal surplus pools. Private landowners, local governments, and state and federal agencies cooperate in a program that provides effective fire control. Some landowners have objected, however, that the fees assessed are excessive in relationship to the benefits received.

Each of the 56 persons employed by the Division of Forestry has an assigned responsibility for fire emergency situations. The division also hires about 200 persons for seasonal fire work. The fire suppression function of the Division of Forestry is concerned only with forest, range, and crop fires; it does not fight structural fires. Recognized agencies such as the U.S. Forest Service, the Bureau of Indian Affairs, and the Division of Forestry cooperate in detection, prevention, and suppression of fires. Zones of responsibility have been established where a recognized agency has the primary obligation.

Fire protection for cropland is provided through a county cooperative program in which the county provides manpower, storage, and equipment and is aided by the Forestry Division with training and equipment. A rural community fire protection program is funded by $60,000 per year of federal money matched locally to organize, train, and equip a local organization.

Under a prescribed burn program, the Forestry Division conducts controlled fires that are intended to improve the resource for subsequent increase in revenue. The prescribed burn program has been successful in achieving that objective.

Fire investigation and law enforcement are taking more important places in the activities of the Forestry Division as the incidence of arson and man-caused and incendiary events increases. The Forestry Division has trained a law enforcement agent to reduce reliance upon U.S. Forest Service investigators. Threats to persons and property are becoming more frequent and more serious and require investigation for prevention or to establish culpability.

A Private Forestry Assistance Program employs six or seven full-time people but involves more than 20 people throughout the Forestry Division. Services to private landowners include advising on protecting yard trees, advising woodlot owners on income or improvement, assistance with timber sale contracts, providing references to private foresters, offering services of a sawmill specialist to determine efficiency of a plant and to improve its efficiency, and providing an entomologist's service on state and private land. Because insects and disease eventually result in fire problems, private landowners are provided any advice and assistance they need to combat these enemies through the Forestry Division, the Forest Service, or private consultants.

The slash disposal program is a responsibility of the Private Forestry Assistance Bureau. The harvester and the Bureau must agree about hazard reduction

requirements. The mill purchasing the timber deducts the slash disposal fees from stumpage payments and pays the state.

The timber sales program allows the harvesting of about 35 million board feet per year from state-owned forests and contributes about $3 million per year to the school trust fund.

The timber inventory program is a continuing activity that will put the staff back into the field in 1986 to reinventory state and private timber.

The state nursery at Missoula produces about 1,200,000 seedlings each year for reforestation. Most of these are Douglas fir, ponderosa pine, and western larch. Some spruce and lodgepole pine seedlings are also produced.

The nursery also conducts a shelterbelt program in which conifers are grown in containers and shipped in soil to provide better root systems after replanting. Recognizing the importance of shelterbelts in reducing wind erosion in eastern Montana, the nursery is striving to improve stock for this use.

The objective of the Timber Management Bureau is to grow trees faster and shorten the growing period to increase the harvesting rate. Essential to this objective are pre-commercial and commercial thinnings. Results are promising, and the progress in the genetic tree program presages increase of 15 to 30 percent of growth rates. Since Montana is a net exporter of forest products for which the national need is expected

to far surpass production, improvement of the growth rate will mean increased revenue for the school fund. Timber harvest requires construction of roads into previously inaccessible locations. Once opened, a road is very difficult if not impossible to close.

Concomitant with the use of roads is the need to educate the public about the benefits of and the uses of public lands opened up to the public and the necessity for wise use and responsible stewardship.

Also underway is a program of acquiring permanent access to state lands through cost sharing with other landowners who will benefit.

PROPOSED REDUCTION IN U.S.F.S. FIRE PROTECTION CONTRACT

Facing the Forestry Division now is a long-range phaseout of the U.S. Forest Service protection of 1,900,000 acres of state and private lands to reduce overall costs to the state and to taxpayers. Such a change would necessitate additional money from the general fund and would require an increase in the maximum assessment limit by the next legislature.

To fulfill its responsibility of providing fire protection to the forest lands of the state, the Division of Forestry must guard about 4,000,000 acres in central and western Montana. To avoid duplication of function and to foster efficiency, a portion of the protection task, or about 2,200,000 acres, has been contracted to the U.S. Forest Service. The Forestry Division reciprocally protected about 280,000 acres of national forest lands within state districts. The net result was an imbalance of about 1,900,000 acres in the state's favor.

Full reimbursement of its fire protection costs at 65.7 cents per acre for the full 2,200,000 acres, or an increase of about 50 cents per acre, totaling about $1,100,000 more than now being paid, was requested by the Forest Service. A similar request was first presented about 20 years ago when the Forest Service withdrew protection from 1½ million acres of state and private land but postponed any further action to recover full protection costs while the state made an "honest effort" to reduce the acreage imbalance. With tightening of federal budgets, the Forest Service has demanded full reimbursement unless a definite timetable

is established by the state for equalization of the protection acreage balance.

To resolve the issue, the Division of Forestry proposed to initiate a program to eliminate over a 10-year period the current protection responsibility imbalance of 1,900,000 acres. During each of five bienniums beginning with 1984-85, about 400,000 acres would be removed from the Forest Service contract and protection provided by the state. Saving to the state over the 10-year period, DSL calculated, could be about $4.5 million if the Forest Service would agree to withhold any increase in fees. The saving every year thereafter resulting from state rather than federal protection would be about $150,000 while maintaining the same level of protection, DSL said.

Any increase in costs of fire protection would probably require an increase in the assessment limit under 76-13-201, MCA, which imposes on the owner of forest land the responsibility to protect against the ignition or existence of fire and to suppress the spread of fire on that land. As an alternative to individual protection and suppression, the Division of Forestry may provide it at cost to the landowner of not more than 16 cents per acre per year and not less than $6 per owner per year in each protection district.

The Land Board is authorized under 76-13-204 to create forest fire protection districts with approval of 51 percent of the owners representing at least 51 percent of the land in the proposed district. Membership in a district is deemed to fulfill the requirements of 76-13-201.

Under Title 7, Chapter 33, Part 22, MCA, a county governing board is authorized to provide rural fire control and to cooperate with state and federal agencies and other counties. Thirty-five counties have entered the cooperative program. Land in an area protected by a county is considered to have complied with 76-13-201.

COMPARISON WITH CANADIAN FOREST MANAGEMENT

The subcommittee was asked to consider the administration of state forests in relationship to the ownership and management system utilized for public forests in Canada.

The Canadian provinces own vast tracts of forest lands. In fact, British Columbia alone is said to harvest more timber annually than the United States Forest Service cuts from the national forests system. Montana's 491,000 acres of state-owned commercial forest lands is but a tiny fraction of the timber lands owned by the provinces of Alberta or British Columbia.

Long-term leases on huge tracts of forest lands are entered into with private development companies by the Canadian provinces. This system contrasts with the timber sale procedures utilized in the United States.

Could the lease system be used to the benefit of the State of Montana?

For an answer to this question, the subcommittee turned to David H. Jackson, associate professor of forest economics and management at the School of Forestry and the Montana Forest and Conservation Experiment Station of the University of Montana.

Professor Jackson's answer was essentially in the negative, for a variety of political, economic, and social reasons.

(A paper presented by Professor Jackson on this topic may be found in Appendix B.)

ECONOMIC RETURN AND MANAGEMENT OF TRUST LANDS

The subcommittee also called upon Professor Jackson for an overview of the economics of harvesting timber from State Forests.

Pointing out that the timber supply situation is increasingly complex, he asserted that prudent funding of long-term timber management can enhance educational finance in Montana while lending stability to the long-term resource base for the forest products sector of the state's economy.

The national forests in Montana were the scenes of an accelerating timber harvest in the years following World War II. After peaking about 1970, the timber harvest in the national forests declined sharply until the 1978 cut was only about 60 percent of the record high.

The 1970s downturn in national forest harvesting in Montana was accompanied by an increase in the volume of cut from some of the large industrial ownerships, but only one of those three large ownerships has sufficient stands to sustain the current level of timber removal much past the present decade.

This fact forecasts substantial market opportunities for prudent expansion of harvests of trust timber after 1990.

Keeping in mind the continuing uncertainties of marketing state timber, prudent harvest expansion on trust lands must be consistent with legal constraints on management.

Professor Jackson told the subcommittee that if the Division of Forestry receives an adequate budget for the optimum intensity of management of second growth timber, the harvest level can probably be increased on trust lands. An increase in the harvest of trust timber will stabilize timber supplies at a time when the harvest on some of the large industrial land ownerships will be diminishing.

Long-term continuity in timber harvesting demands avoidance of massive changes in the level of the annual cut. There is important economic justification for what has been called "modulated change in harvests over time" in preference to the "boom and bust" approach to rapid liquidation of merchantable inventories.

Since forest growth depends partially on the level or intensity of timber management, the budget for managing timber becomes a determinant of future supplies. Overcutting can result if harvests are based on forecasted budget levels which are higher than actually funded. Professor Jackson suggested that harvest schedules should be prepared for various long-term budget levels for the Division of Forestry and cutting totals must be adjusted each biennium in the light of the actual budget.

The geographic dispersal of state timber holdings throughout a vast portion of the western half of Montana implies that a prudent manager will concentrate limited budgets where the probable financial returns warrant the application of resources. This fact emphasizes the importance of the inventory system to identify the land and timber assets which will be updated as stands mature or are harvested.

Systematic calculation of the level of harvest accompanied by realistic investment and budget for the management of forest trust lands can lead to a substantial sustainable increase in timber cut. Within reason is the expectation that recent harvest levels can be doubled. The time needed to achieve this higher harvest level will depend upon the budget for intensive management and the composition of current timber inventories.

Expanded timber harvests will favorably impact on educational finance. With a $150,000,000 trust fund expanding at about $2,000,000 per year as a result of timber sales recently, a substantial increase in timber sales revenue will significantly accelerate that growth. The future earning capacity of the trust fund will be enhanced by any additions from the sale of timber encouraged by prudent and comprehensive timber management planning.

(Professor Jackson's paper on "Economic Returns and the Management of Montana's Trust Forest Lands" can be found in Appendix C.)

Determination of total annual timber growth is conjecture because a precise base inventory and the rate of accretion have never been established. The Division of Forestry is completing a statewide inventory, and indications are that overcutting is not occurring. About 53 percent of annual timber harvest in recent years originated on private lands, a proportion that has grown steadily over the past 10 years. This trend is developing despite federal ownership of most of the timber lands.

Harvesting of old growth timber may be delayed by a number of considerations. The checkerboard pattern of ownership dictates some restraints to preserve cooperation among neighbors. If harvesting is occurring on an adjoining tract, the other owner may decide to postpone cutting to preserve a watershed or other natural attributes of an area.

Recent annual harvest from state forests has been about 35 million board feet (MMBF), but the annual growth rate is considerably greater than the rate of removal and the Division of Forestry estimated that an annual cut of 50 MMBF can be sustained. This increased cut would require an increased legislative appropriation to fund 12 additional full-time equivalents (FTEs). Slash disposal, timber stand improvement and reforestation would probably require another 12 persons. Total annual costs of about $750,000, the Division estimated, would result in increased earnings of about $1,250,000.

The escalating value of the state's timber resource is illustrated by the fact that in 1968 stumpage prices averaged $15 per thousand board feet (MBF), and the price now is about $115. The state usually realizes a higher return for its timber than does the Forest Service because much higher road construction standards in the national forest probably reduce the return to the federal government by up to $25 MBF.

Wood products industry representatives agreed that although the market is cyclical and periodically goes "soft", a future decrease in interest rates could stimulate sufficient demand to absorb the additional harvest. The trend of declining national forest timber sales increases the market share for state timber. It

was also noted that the growth rate on industrial and nonindustrial private stands exceeds the harvest rate.

FOREST FIRE SUPPRESSION AND CONTROL

Among the statutory responsibilities of the Department of State Lands is the protection of forest resources from wildfire. Studies have calculated that the value of the various classes of property which DSL is charged with protecting approaches $13 billion.

The nature of fire gives it the ability to spread rapidly without recognition of property boundaries, and this fact demands rapid suppression of wildfire. A corollary is that a fire intended to consume slash or to improve a habitat or cover type must be carefully planned with ignition and spread carefully monitored and controlled. The existing fire protection is intended to forestall the renewal of a situation where millions of acres of timber burned in one summer, homes were destroyed, lives lost, towns evacuated, and watersheds laid bare.

Funding for Forest Fire Districts and Affidavits

Funding of wildfire prevention, control, and suppression has been cooperatively provided from private, state, and federal sources based on the combination of benefits received by each party, the need for protection on state lands, and the public fire threat to private lands and resources. Based on the findings of a 1958 study by Battelle Institute, forest fire protection costs have been assigned one-third to private property and two-thirds to public funding.

However, since 1958, an increase in forest home subdivisions, increased reliance on forest watersheds by downstream users, and expanded recreational

activities by nonforest landowners have markedly increased the benefits enjoyed by all segments of the population from forests both public and private.

The private landowner finds himself forced to accept the costs of providing protection against fires caused by the public. Recent findings show that 86 percent of fires on state-protected areas were caused by other than the forest landowner or his agent.

In addition to providing funding through an annual assessment fee, private forest landowners and the forest industry provide personnel such as ranch hands, mill workers, woods crews, and foresters to serve as firefighters as well as equipment such as tractors, plows, chain saws, dozers, and transport vehicles. Private roads built and maintained by the forest industry provide access to fires.

A Forest Fire Protection District may be created by the Board of Land Commissioners if approved in writing by at least 51 percent of the owners representing at least 51 percent of the acreage in the district. Under existing law (76-13-201 and 76-13-207), DSL may assess a fire protection charge not to exceed 16 cents per acre per year and not less than $6 per owner per year in each protection district.

Individual forest landowners outside of districts may request protection from the state if a recognized protection agency agrees to accept the area. The landowner must sign an affidavit agreeing to pay the fee established by 76-13-201.

The Forest Fire Protection Districts and the Affidavit Units are intended for areas that normally require more than local forces to suppress wildfire.

State-County Cooperative Funding

This program provides that the county and the state may enter into an agreement and then assist each other in providing local volunteers with the assistance necessary to attack and suppress wildfires. Counties that desire to enter the program must obtain legislative approval and the Legislature must fund the state's share of the cost of protecting all state and private lands outside Forest Fire Districts and Affidavit Units.

Thirty-five counties have elected to join this system which is intended for areas where the fuels are lighter and the types of fires more readily lend themselves to suppression by local forces. Eight more counties are currently requesting to join the system.

Self-Protection

In the absence of a Forest Fire Protection District, Affidavit Unit, or State-County Cooperative, the landowner must provide self-protection against the ignition or spread of fires. The counties are not required to provide fire protection assistance to the landowner.

Rural Fire Districts or volunteer fire companies may be formed by landowners to aid in fire protection, but a fire that exceeds their suppression capability becomes

a concern of local or state government as a local emergency.

U.S. FOREST SERVICE INTENTIONS

For many years the U.S. Forest Service has been encouraging the state to become an equal partner in the task of providing fire protection to forest lands, but the state did not act until the federal agency threatened to begin charging "full costs" for its protection chores on the portion of state and private acreage in excess of the amount of national forest land protected by the state.

This imbalance had amounted to 1,916,000 acres.

The state pays the Forest Service about 16 cents per acre for this service, but imposition of "full cost" could raise the charge to about 65 cents per acre.

Faced with this sharp raise in charges, the 1983 Legislature approved funding, and DSL assumed protection responsibility in the Libby Block in this biennium.

The Libby Block of 355,000 acres was the first increment in a five-step shift of fire protection responsibility which at the end of a decade will bring the federal and state protection duties into equilibrium.

The second increment of 420,000 acres is the White Sulphur Springs Block, which DSL proposes to assume in the 1986-87 biennium.

Other areas proposed to come under state forest fire protection are:

- Swan River-Seeley Lake, 400,000 acres, 1988-1989
- Bozeman North, 400,000 acres, 1990-1991
- Bozeman South, 400,000 acres, 1992-1993.

The regional forester of the U.S. Forest Service has agreed that while the state is moving forward with this program of protection equalization by stages, the "full cost" charge will not be implemented on the decreasing imbalance.

An important task facing the subcommittee was to determine if the best interests of the state lie in assuming increased protection responsibility and the accompanying outright expenditures or in accepting the "full cost" charges to be imposed by the Forest Service for continuing its protection duties on a greater acreage of forest than the state protects.

DSL told the subcommittee that for the seven years ending in 1983, the Forest Service's average rate (with high and low years dropped and calculating the remaining five years) for fire protection was 64 cents per acre.

Over five years, the Forest Service's suppression costs averaged $4,370 per fire compared with DSL's average suppression cost of $1,413 on each state fire.

These facts indicate that if the Forest Service experiences several high fire incidence years, the agency will spend 3.1 times as much per fire than DSL would to suppress the same fires. The Forest Service would pass these higher firefighting costs on to the state by increasing the rate per acre.

In 1981, the Forest Service rate for fire protection services was 63 cents per acre. In 1984, the USFS rate was 47 cents per acre.

DSL calculates that over 10 years the state would expend $34,490,936 to protect forest lands for which the Forest Service would charge $34,916,730 for the same service at 47 cents per acre.

If movement of the Forest Service rates is back toward the seven-year average of 64 cents per acre, the potential economy to be achieved by DSL assumption of fire protection will increase correspondingly. Total savings for the state would exceed $4 million over 10 years if the Forest Service rate were 64 cents per acre.

DSL is confident that in the short run the state can undercut the Forest Service's cost to provide fire protection because of the Forest Service's incentive of continuing the 16 cents per acre charge for fire protection during the interim when the state is phasing in its larger share of protection responsibility.

The long-term result, however, depends on the rate to be charged by the Forest Service.

Before the late August 1984 epidemic of forest fires throughout Montana, DSL calculated the cost of direct state fire protection on forest lands at 47.2 cents per acre, and the Forest Service's indicated charge for the fiscal year was 50.4 cents per acre.

FUNDING OPTIONS

The current statutory assessment rate of 16 cents per acre with a minimum annual charge of $6 per owner yields about $750,000 a year.

DSL estimates that each one-cent raise in the acreage rate will generate about $40,000 per year. Each increase of $1 in the minimum charge will generate about $30,000 annually.

DSL estimates that assessment collections would have to increase by $661,522 to fund the reduction in federal protection when full state assumption is accomplished in fiscal year 1992.

The increased collections could be achieved by any combination of increases in acreage rates and/or minimum charges considered most equitable by the legislature.

A possible reaction to a large increase in assessment rates could be a cancellation of affidavits by some of the landowners now covering about 454,000 acres. Revocation of affidavits may place an additional burden on counties and local landowners and may involve the state in some very large fires because of failure of local forces to suppress fires during overload conditions. Added suppression costs could far surpass the added income from higher assessments.

Although about 15 percent of all wildfires on state and private lands--or approximately the same percentage as those ignited by forest landowners--are associated with recreational activity, there is no mechanism currently

in place for requiring sportsmen to share in fire protection costs. Lacking direct access to the recreationists, DSL looks to the state general fund to provide money to finance protection against the risks they cause.

The subcommittee was told by officials of the Division of Forestry that the Forest Service's protection responsibility embraces much less developed and populated land than does the state's area of concern with the result that the state's fire incidence is twice as great. The value of property at risk on small ownerships is usually much greater proportionately because residential developments concentrate high values on tracts of 40 acres and less.

Despite the fact that DSL does not fight structural fires, the existence of residential developments in an area causes fires on small tracts to be fought more aggressively and at more cost to the state because small tract owners usually cannot assist by supplying manpower or equipment. This reality, coupled with the administrative cost of $6 or $7 per year to collect an assessment from a landowner, sharply reduces the effectiveness of the assessment as a mechanism for financing forest fire protection.

Findings of a study conducted by Battelle Institute indicate that the private ownership's share of forest fire protection costs should be at least 16 percent, the state should assume between 25 and 44 percent and the federal government should assume 40 to 59 percent. Because the midpoint in the state range was 34 percent and the private share was 16 percent, DSL chose a ratio

of 2:1 state to private funds or two-thirds state and one-third private.

The 16 cents per acre fee is currently paid by 8,857 large landowners who contribute a total of $643,972. The cut-off point on the $6 minimum fee is 38 acres; an owner of more than 38 acres is assessed the acreage fee. The minimum fee is paid by 28,629 owners who contribute a total of $171,774.

Increasing the minimum fee to $30 while leaving the acreage charge at 16 cents would raise the equalization point to 188 acres with the result that 3,866 large landowners would pay $603,764 at 16 cents per acre and 33,620 others would pay $1,008,600.

DSL did not contemplate, even if the statutory minimum were increased to $30, an immediate escalation of the minimum charge to $30. Rather, the expressed intention was to raise the charge by stages: perhaps to $12 in 1986, to $18 in 1988, to $23 in 1990, to $28 in 1992, and finally to the maximum $30 in 1994. This staging could be assured by a statutory requirement that the funding ratio be maintained at two-thirds state and one-third private.

CONCLUSIONS AND RECOMMENDATIONS

After receiving presentations from the Department of State Lands and the Division of Forestry, representatives of the wood products industry, academic specialists on forest economics, legislative fiscal staff, and the public during three meetings that were devoted to gathering information and to hearing all viewpoints on the subjects under consideration, the subcommittee concentrated its discussions of HJR 40 during its last two meetings to formulation of recommendations and approval of implementing legislation.

By its decision at the first meeting to focus the study's attention on the problems of forest fire protection and of timber production on State Forests, the subcommittee set the tone for the biennium's activities. The conclusions and recommendations accordingly reflected the concentration on forest fire suppression and timber harvest.

At the fourth meeting, the subcommittee adopted these recommendations:

(1) The Department of State Lands continue its phased program of equalizing forest fire protection responsibility with the United States Forest Service:

(a) by assuming the White Sulphur Springs Block, the second of the five blocks calculated to achieve equalization over ten years, during the 1985-86 biennium; and

(b) that a determination be made in 1986 if it is advantageous to the state to assume Blocks 3, 4, and 5.

(Approved 7-0 with Representative Jim Jensen absent.)

(2) The annual fee for fire protection on classified forest land under 76-13-201, MCA, remain at 16 cents per acre, but the minimum charge per landowner in each protection district be increased from $6 to $30, with the stipulations that:

(a) Department of State Lands increase the minimum assessment by stages as necessary;

(b) the 2:1 state-to-private cost share ratio be continued on forest fire protection assessments so that the total assessed against private land is no more than one-third of the total appropriated by the legislature for that purpose in any one year; and

(c) Department of State Lands inform the Legislative Finance Committee by August 1 preceding the regular session of the legislature of the assessment expected to be levied against private land for the next biennium.

(Approved 7-0 with Representative Jim Jensen absent.)

(3) Appropriations each year be increased by $315,000 from the general fund and $540,000 from the earmarked revenue fund to increase the annual timber harvest from State Forests by 15,000,000 board feet and to increase the annual income to the permanent school trust fund by $1,125,000

(Approved 5-2 with Representative Keyser and Senator Boylan voting "no" and Representative Jim Jensen absent.)

The subcommittee instructed the researcher to draft any bills necessary to implement the recommendations.

PROPOSED LEGISLATION

Recommendations (1) and (3) will be implemented through the appropriations process, and the Department of State Lands included the requests for the requisite funding in its budget for the 1986-87 biennium.

Implementation of Recommendation (2) required the amendment of existing law. LC 68 was drafted for this purpose and is Appendix A of this report.

At its fifth and final meeting, the subcommittee approved LC 68 for recommendation for enactment by a vote of 6-0 with Senator Conover and Representative Jim Jensen absent.

By the same vote the subcommittee reaffirmed its approval of Recommendations (1) and (3) and instructed that they be included in the subcommittee's report.

SOURCES

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John K. McBride, St. Regis Corporation, Statement, to Interim Joint Subcommittee No. 2, January 14, 1984

Andy Lukes, Champion International Corporation, Key Points, presentation to Interim Joint Subcommittee No. 2, January 14, 1984

APPENDIX A

_____ BILL NO. _____

INTRODUCED BY _____

BY REQUEST OF JOINT INTERIM SUBCOMMITTEE NO. 2

A BILL FOR AN ACT ENTITLED: "AN ACT ALLOWING AN INCREASE IN THE MINIMUM CHARGE TO CLASSIFIED FOREST LANDOWNERS FOR FIRE PROTECTION UP TO $30; LIMITING ASSESSMENTS TO NO MORE THAN ONE-THIRD OF THE TOTAL APPROPRIATED BY THE LEGISLATURE FOR FOREST FIRE PROTECTION; AMENDING SECTIONS 76-13-201 AND 76-13-207, MCA; AND PROVIDING AN EFFECTIVE DATE."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

Section 1. Section 76-13-201, MCA, is amended to read:

"76-13-201. Duty of owner to protect against fire. (1) An owner of forest land classified as such by the department shall protect against the starting or existence and suppress the spread of fire on that land. This protection and suppression shall be in conformity with reasonable rules and standards for adequate fire protection adopted by the board.

(2) If the owner does not provide for the protection and suppression, the department may provide it at a cost to the landowner of not more than 16 cents per acre per year ~~and not less than $6~~ <u>except that the department shall make a minimum assessment of up to $30</u> per owner per year in each protection district <u>as necessary to yield the amount of</u>

money provided for in 76-13-207. The owner of the land shall pay to the county treasurer of the county in which the land is situated the charge for the same approved by the department in accordance with this part and part 1.

(3) No other charges may be assessed those landowners participating except in cases of proven negligence on the part of the landowner or his agent."

Section 2. Section 76-13-207, MCA, is amended to read:

"76-13-207. Determination and collection of costs of fire protection. (1) The department shall prepare an annual operation assessment plan in which fire protection costs are determined. The department shall request the legislature to appropriate the state's portion of the cost. After the appropriation is made by the legislature, the department shall cause an assessment to be made on the owners of classified forest land, as specified in 76-13-201, sufficient to bring the total amount received to the amount specified in the approved plan but the department may cause no assessment for forest fire protection to be made on owners of classified forest lands which will yield an amount greater than one-third of the total appropriated by the legislature for that purpose in that fiscal year.

(2) On or before August 1 preceding each regular session of the legislature, the department shall inform the legislative finance committee provided for in 5-12-201 of

the assessments it expects to make upon owners of classified forest lands under subsection (1) during each year of the next biennium.

~~(2)~~(3) On or before the second Tuesday in August of each year, the department shall certify in writing to the county assessor of each county the names of these owners of forest lands in his county, together with a description of their lands and a statement of the amount found to be due and owing by each of the owners to the department for forest fire protection.

~~(3)~~(4) Upon receiving the certificate from the department showing the amount due, the county assessor shall extend the amounts upon the county tax rolls covering the lands, and the sums shall become obligations of the owner to be paid and collected in the same manner and at the same time and with like penalties as general state and county taxes upon the same property are collected."

NEW SECTION. Section 3. Extension of authority. Any existing authority of the department of state lands to make rules on the subject of the provisions of this act is extended to the provisions of this act.

NEW SECTION. Section 4. Effective date. This act is effective July 1, 1985.

-End-

APPENDIX B

SOME OBSERVATIONS ON CANADIAN APPROACHES TO FOREST LAND TENURE AND THEIR APPLICATION TO MONTANA FOREST TRUST LANDS

By

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Presented at the request of
Joint Interim Subcommittee No. 2
of the
Montana Legislature

December 8, 1983

Between the period of August 1974 and August 1976, I enjoyed the privilege of being an Assistant Professor of Forest Policy at the University of Alberta in Canada. There is some interest among legislators in Montana to adopt Canadian approaches to management of the trust forest lands in Montana in lieu of current managerial arrangements. The following remarks reflect my views on the subject.

To be more specific, most of the forest land in Canada of commercial importance is owned by the respective provinces. In many instances, long term rights to manage and harvest timber on these lands are held by private industry. In British Columbia alone, there are at least five kinds of tenure arrangements. In general, these arrangements provide a degree of certainty over cutting rights for reasonably long periods of time. The remainder of these observations attempt to suggest why this general approach to forest policy has evolved in Canada as well as why, in my opinion, these arrangements are not particularly suited to the trust lands in Montana.

Canada has perhaps unparalleled wealth in terms of its timber resources. There is as much timber land and timber harvested in British Columbia alone as there is in the entire U.S. National Forest system. Yet, the population of Canada is roughly equivalent to the population of the state of California. Furthermore, in spite of the great Canadian land mass, the country is actually highly urbanized. The majority of Canada's population lives within 150 miles of the U.S. border--in very large modern cities. Of course, much of the forest wealth of the country lies far to the north of Canada's population centers.

Like most modern nations that are concerned with the growth of economic well being, Canada is exploiting its particular comparative advantages. Coupling the size of its population with the abundance of timber suggests that

few, if any other countries in the world possess as much timber on a per capita basis. Exporting its wood wealth on world markets is a logical means to exploit one of Canada's clear comparative advantages.

Like the U.S., Canada in her early history, alienated public lands to private ownership. And like the U.S., public sentiment evolved toward retention of the unalienated public domain under governmental management. Unlike the U.S. however, the control of unalienated public lands was ultimately vested in the provinces. This represents one key reason why Canadian provinces have more power relative to the central government in Ottawa than do the various states relative to our national government in Washington, D.C. For instance, Premier Lougheed of Alberta controls the lion's share of Canada's oil and gas resources.

The fact that there is so much more public (provincial) land in Canada is the result, at least in part, of past population dynamics. When the provinces started to close the door to further homesteading, the population was far smaller than in the U.S. and there was far more land left for public control. Finally, forest lands to the extent they exist, are located in proximity to the areas of early settlement.

Wilderness preservation has scarcely raised the tremor in Canada that it has raised in the U.S. In recent years, major portions of the land base have been dedicated to parks and wilderness areas by both the provinces and the federal government. At the same time there has been substantial increases in the developed land base. Canada is still very much involved in conquering its frontiers and the Canadian frontier largely represents the north, not the west. It would be fair to suggest that there is not the same perception of scarcity of either a land base for development nor a land base for preservation.

And when either kind of allocation decision is made, Canadian authorities seldom have to wrestle with the checkerboard or interlocking ownership problems that are so common in the U.S.

Thus, when the Province of Alberta started to develop Forest Management Agreements (which are 20-year leases and renewable indefinitely) with large wood products companies in the 1960's; they were able to grant contiguous areas of up to about 1,000,000 acres in size.

Long term leasing of this kind accomplish several things in the light of Canada's current setting.

(1) First it allows the attraction of major (often foreign) capital investment funds.

(2) It allows exploitation without much provincial forestry bureaucracy and control of logging, roading and reforestation.

(3) It allows the commingling of timber resources with milling establishments in order to diversify the economic base. (Although Canada is still highly dependent on agriculture, timber and minerals and as such is extremely dependent on velatile world markets).

In short, Canadian approaches to forest land tenure have evolved as a result of:

(1) provincial control of resources:

(2) a vast unconquered forest wealth;

(3) a small domestic highly urbanized population:

(4) the general public sentiment to acquire wealth.

In spite of the larger instrastructure for government planning in Alberta, I was never able to accurately estimate how much revenue the province directly received from exploiting its timber. At one time I was convinced that the

estimated value of the coyote pelt harvest was about seven times greater than the provincial income from selling timber.

There is little doubt in my mind that both British Columbia and Alberta are charging less for their timber than could be earned with competitive sales. However, one should also keep in mind that (ignoring exchange rates) Canadian labor in the forest products sector is earning some 30% more than their U.S. counterparts. Labor is more scarce relative to wood in Canada than it is in the U.S. so one would have to anticipate that we would pay more for timber and less for labor in the U.S. than in Canada.

Even if the Canadians are currently "giving away" their timber to some considerable extent, the key difference between Canada and the U.S. in this regard is a matter of historical timing. Considerable amounts of private forest land in Montana resulted from railroad land grants. Other private tracts evolved through homesteading and what historians view as substantial mischief under the Timber and Stone Act.

If in Canada, the price paid for timber is less than its value, there is an uncompensated transfer of property rights. The difference between the two values represents a part of the private companies wealth. There is also private forest wealth in the U.S. that resulted from the fact that individuals and companies acquired their assets at lower values than they are currently worth.

In Montana, trust lands are dedicated to support the public education system. The entire forest trust land base of 491,000 acres is smaller than Weyerhaeuser and Gamble Cellulose lease in Grand Prairie, Alberta. Furthermore, due to the fact that school grants involved two sections per township, a considerable amount of trust timber land is still scattered around the state. [illegible] very sensible land exchange, which resulted in consolidation

of some tracts). But the largest state forest is about 100,000 acres, not one million acres.

If Montana were to adopt long term leases, it is highly unlikely that the state could earn as much as it currently does on its trust assets under existing arrangements. Right now, the income from selling timber is some eight times greater than the cost of getting the cut on the market. Canadian tenure arrangements would not be as profitable for the school trusts.

Montana does not have a large unexploited forest trust land base. We can not use our land and timber to attract large quantities of domestic and/or foreign investment. We have a much larger contingent of trained forestry professionals in the U.S. than is the case in Canada, particularly on a per acre basis. And our laws suggest that the land be managed for income, not simply to create a more diversified economic infrastructure.

At times, Canadian leases are allocated to the highest bidder when the lease is established. Following lease establishment, royalties and/or rentals are paid for harvesting timber and land use. Once a lease is assigned, competitive allocation of timber ceases. The leasee or company exploiting the timber has a reasonably secure long term interest in the land and timber. In contrast, the Division of Forestry advertises all timber for competitive bidding before logging on an area commences. Cutting rights to reasonably small and specific tracts are allocated to the highest bidder. The Division of Forestry retains the long term interests in managing the land under a trust partnership with the U.S. Congress as identified in Section X of Montana's Constitution.

Competitive sales will almost invariably return greater gross income from timber exploitation than will leases. There are several reasons for this fact. Typically, long term royalty payments (stumpage payments) under lease arrangements are agreed upon using an appraisal formula of one kind or another.

Found in most appraisal formulas are provisions for product values and production costs. No two timber stands are alike. Particularly in mountainous areas, costs of logging can vary considerably between stands and areas. Furthermore, some timber is located quite close to sawmills and other timber is quite distant. Appraisal formulas on which royalty rates are based, typically allow for a variance in haul costs. Normally, some trees in a timber sale are worth considerably more than others. Large trees cost less to log on a thousand foot basis and are usually converted into more valuable products. Appraisal formulas which form the basis for royalty charges rely on using industry averages for both the cost of logging and manufacturing as well as the value of products produced from the timber.

Competitive bids will almost invariably exceed the value of royalties based on an appraisal formula because the "average" bidder never wins a timber sale. No two timber purchasers are alike. Differences within the forest products industry exist in terms of (a) the kinds of products manufactured, (b) the quality and cost of labor, (c) the quality and cost of management, (d) location, (e) quality, kind, age, and maintenance of capital equipment. Competitive bidding assures us that timber will be allocated to its highest valued use, not average value use. Since no two timber sales are alike and no two timber purchasers are alike either, a firm can outbid its competitors on some sales and lose on others. Competitive bidding will yield higher prices than the average value of all bidders. Using competitive bidding will assure us of the highest gross income for the trust fund not the lower value resulting from royalties based on appraisal formulas. As soon as long term leases are established, the fundamental problem is to develop lease rates without competitive sales. Leases are long term in nature and one has to establish a contractual procedure for pricing timber 20 to 30 years into the future.

Finally, both outright fee simple ownership of forest land and public management of forest land usually provide stronger long term interests in land management than do leases. Timber investments have unparalleled longevity in our economic system. We find both the capitalist sector and the public sector investing in reforestation where payoffs are 50 to 100 years away. It is extremely difficult to build investor security into long term forest leases so that short of forcing the leasee to reforest, these investments will be made.

In my opinion there is less investor security under forest land leases in Canada than there is on private fee simple land in the United States. Canadian provincial governments are closer to the parliamentary style of government used in Great Britain than are state and federal constitutions in the U.S. When a new political party takes power in a Canadian province, there is exceptional latitude under the laws to change administration of the public lands. Things which may appear minor at first glance such as reforestation standards, road design standards, and timber harvesting standards are not specified in the lease arrangements. Relaxing or tightening these standards can be done administratively at the Cabinet level and the relationship between these standards and industry profits should be rather obvious.

A few years back the New Democratic Party (NDP) with about 40% of the popular vote was able to gain control over the Social Credit and Liberal parties in British Columbia. Among other things, the NDP decided to take over the auto insurance industry, and did so. Under a previous British Columbia government controlled by the Social Credit party, a decision had been made for the province to purchase a large private forest products company near bankruptcy. Shortly after the socialist NDP party took power, it was realized that a subsidiary of the provincially owned forest products corporation had significant central

America operations. It was with some degree of embarassment that leftists in British Columbia learned that their party was, in effect, "exploiting the natives of Central America." Provincial governments in Canada are different from state governments in the United States. When people from the U.S. first visit Canada, they typically express the feeling that there is little difference between the two countries. Observable symbols of material well being are extremely similar as are our shared cultural pasts or ethnic roots. But, public life in Canada is substantially different. Canada does not have the weight of the world on its shoulders. Instead of spending so much of their public revenues on the military establishment, they instead spend considerable amounts on socialized medicine (incidently, it works quite well in Alberta).

Just as a provincial government owns an Airline (Alberta owns Pacific Western Airlines) and another province owns a firm in the forest products industry that openly competes with private capital, the federal government owns a television network (CBC), a railroad (C.N.), an airline (Air Canada) which compete with private companies in their respective industries. Simply stated, under the Canadian rules of the game (government), both the public and private sectors have evolved differently than is the case of the U.S. This is so in spite of the fact that we are both nations wherein essentially western European immigrants imposed "democracies" on lands inhabitated by indigenous populations ("Indians").

[illegible] if a forest land tenure arrangement in Canada is successful in terms of fulfilling public sentiments, there is no reason to believe that it will necessarily be the case if adopted in Montana. While it is unquestionably important for Montana to learn from others, it is also equally important to [illegible] the historical role and significance of state trust lands in

Montana. In 1889, land coupled with hard work (labor) was a key source of wealth. Simultaneously, public education, broadly available to the citizenry, was a fundamental requirement for democratic state government. Lands were dedicated from the public domain as a source of wealth to support education in Montana as a basis of statehood. Under these basic tenets, the current arrangements regarding management of trust lands by the Division of Forestry with timber disposal via competitive sales can be lead to the highest possible level of financial support for education from the forest trust land base. While the Enabling Act allows for the sale of trust lands, proceeds from sales must be deposited in the school funds. Ninety-five percent of interest earnings on the funds form a portion of equalization payments to the local schools. As the purchasing power of money atrophies with inflation, the real value of the interest payments slowly falls. Hence, retaining the lands under public trust management will likely provide the most favorable solution to school funding available to the state because the lands and income derived provide an extremely sensible inflation hedge.

APPENDIX C

ECONOMIC RETURNS AND THE MANAGEMENT OF MONTANA"S TRUST FOREST LANDS

I. Overview

In 1889, the Congress of the United States approved

> "an act to provide for the division of Dakota into two states and to enable the people of North Dakota, South Dakota, Montana and Washington to form Constitutions and state governments and to be admitted into the union on an equal footing with the original states and to make donations of public lands to such states"[1]

Any public land management flows from the laws enabling it. In Montana, the legal basis for the management of trust lands is as fundamental as statehood, itself. Starting with a brief summary of the legal foundations for timber management on Montana's trust lands, this paper in turn sketches the appropriate economic criteria for the major decisions facing Montana trustee foresters.

As the word trust suggests, there is a fiduciary relationship between the land and resources being managed and the beneficiaries of the trust arrangement. Montana's trust lands were established to support the public schools and the institutions of higher education. Thus, the lands were used as a form of capital to support education. But the lands and earnings derived from them have never been sufficient to provide all of the financial base for public education in the state. Currently, the approximate 5,000,000 acres of common school land and $150,000,000 trust fund balance provide perhaps 10% of the total annual expenditures for the public schools. Of course, the major sources of funding are property taxes and state aid and these sources account for the lion's share of educational finance in the state.

ECONOMIC RETURNS AND THE MANAGEMENT OF MONTANA'S TRUST FOREST LANDS

by

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December 5, 1983

But, with shrinking federal aid to state and local governments, and an extremely lethargic economy of recent years all traditional funding sources for public programs are receiving much closer scrutiny. If the financial performance of forest trust lands can be improved, additional income derived will be welcomed relief to already stressed revenue sources.

II. The Legal Framework in Summary[2]

Both the original constitution of 1889 and Montana's new constitution of 1972 recognize that the lands are granted to Montana in trust. The purpose of the land grants are extremely clear. The "common schools" received two sections per township and the universities received specific acreage amounts. These lands were to provide financial support for education.

Granted lands can be sold, but they must be sold at fair market value and the proceeds are to be invested in a permanent trust fund which is to "remain forever inviolate against risk and diversion." Apparently owing to the traditional English definition of land as including any objects affixed to it, a timber sale is treated as a sale of part of the interest in the land. Timber sale receipts are deposited in the respective trust fund and the funds are invested by the State Board of Investment. Other income from trust lands such as grazing fees are turned over annually to the schools and universities along with interest earned on the various funds. Thus, only a portion of the land earnings are invested in the permanent trust fund.

Unsold lands which are managed in trust require other sources of funding for management activities. The Department of State Lands, Division of Forestry, is responsible for trust management of the forested

lands. While the Division has other management responsibilities, in recent years the annual timber sale receipts from selling trust timber are some 8 times greater than the state budget for managing these lands.[3]

Land uses which either pay no financial reward to the schools or a financial reward which is less than could be earned if the land was allocated to some other use are inconsistent with the trust mission. If the state chooses to allocate land to some non-incoming earning use, then the schools must be compensated for forgone earnings.

The principle of land allocation should be stressed. Trust land is allocated to its highest valued use using market prices and costs to compute value. No doubt there are legal constraints to allocation and management. But the ability to constrain allocation and management appears to reside as much with the U.S. Congress as with the State Legislature. For instance, federal water pollution legislation apparently constrains management of trust lands and may reduce trust income in some instances. The State Legislature does however control the purse strings for the Department of State Lands so actual control as is recognized in Article X of Montana's constitution involves the Congress and the State as parties to the trust.

If the state violated its trust responsibilities, the land itself could revert back to the federal government. While this is no doubt rather unlikely given Montana's Constitution, it does stress the unusual nature of the trust lands in the state.

III. The Division of Forestry: Its Role and Achievements

Approximately 491,000 acres of the 5+ million acre trust estate is considered forest land. Currently, there is over 2.3 billion board feet

of standing timber on these lands. In recent years the harvest has been about 30 million board feet annually. This means that about $2 million of new (trust fund) investments are made available annually as a result of the timber sales program.

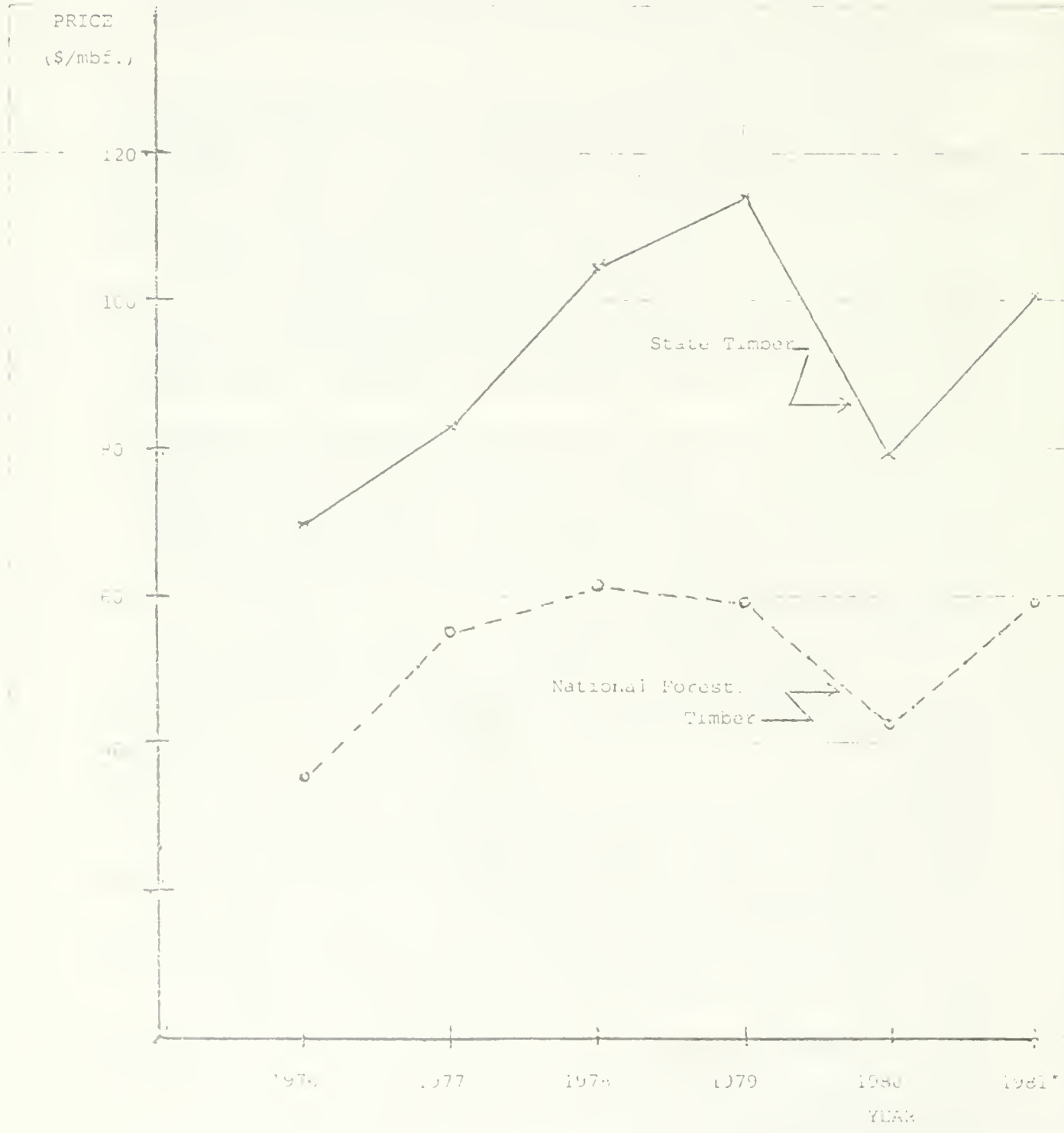
The Division of Forestry has three highly related programs under its administrative jurisdiction. In addition to its trust land responsibilities, the Division provides fire protection services and also is involved in Private Forestry Assistance (PFA). This latter program, which is funded in part by the federal government, allows the Division of Forestry to offer free professional advice to private nonindustrial forest landowners.

Forest protection, mamagement of trust forest lands and professional advice to Montana's private nonindustrial landowners allows significant transfer of knowledge between ownerships and operations. This can be substantiated in the following ways.

First, the graph in Figure 1 compares the average selling price of timber sold from Montana's national forests with the price of timber sold from school trust lands. The Division of Forestry is able to sell timber at almost twice the price of timber sold on the National Forests in recent years. There are, no doubt, several related reasons for this phenomenon. Basic to the reasons, however, is the difference in legal mandates for forest management on the national forests versus management on trust lands. National forest land managers must consider the impact of logging on related non-commercial forest uses. In many circumstances, national forest timber sales are designed to mitigate against disturbances which are non-financial or non-commercial in nature. This often reduces the price of

PRICES OF TIMBER SOLD IN MONTANA·

STATE OF MONTANA VS. NATIONAL FORESTS



timber. Trust management for the school investment fund mandates that financial matters are of a paramount importance. The higher timber prices associated with state sales indicates a fulfillment of the trust mission.

Foresters employed by the Division of Forestry also provide technical aid and assistance to private nonindustrial forest land owners in Montana. Advice is not compulsory. Advice is offered at the request of the landowner. Foresters are able to transfer the knowledge gained through the management of trust lands to private landowners. In a recent pilot study of Private Forestry Assistance (PFA), it was found that private landowners who seek and use state advice were able to earn an estimated $265,000 more in selling their timber in one year (1979) than was the case of landowners who did not use PFA.[4] In addition this pilot study showed that PFA influenced the growth of timber on private lands. Landowners who use PFA can expect to grow about 1.8 thousand board feet per acre more timber in thirty years than landowners who didn't use state advice. Discounting future growth for the state back to the present suggests again that in 1979 alone there was about $115,000 worth of additional landowner benefits generated by the PFA program. Higher stumpage prices and higher growth suggests that the benefits of PFA in 1979 were better than three times the combined federal and state costs of the entire program. PFA increases taxable income in Montana. A substantial part of the state's costs are returned through higher income tax payments.

Since foresters employed by the Division of Forestry are involved in both PFA and management of trust lands, the above discussion suggests rather substantial achievements. Not only does the Divison positively

influence the long term funding support for Montana's educational system, it also is able to improve the return on investment on managing and growing timber on private nonindustrial forest lands.

At the present time it is difficult for the State Legislature to systematically fund long-term management of trust forest lands in Montana. The kinds of issues which are outstanding can be addressed through a series of questions. They are as follows:

1. How much should be invested by the state in intensive timber management on trust lands?
2. How much should be harvested annually from trust lands?
3. What is the relationship between the Division of Forestry's budget for managing trust forest lands, the earnings from the trust fund and the needs for state aid in financing education in Montana?

Answers to these kinds of issues are typically provided by comprehensive timber management planning. Plans of this nature are ordinarily developed by public and private organizations which manage large forest ownerships. Basic to this decision making are annual management costs, current forest inventory information, growth and yield forecasts, expected long-term harvest levels and harvest receipts. If timber management plans or guidelines are developed for Montana's trust lands, they must be designed so that they are consistent with the legal framework for trust management. Development of such a management system will allow systematic investigation concerning the above enumerated issues.

Additional to the need for systematic timber management guidelines is another rather undeniable fact. The timber supply situation in Montana

is more complex than ever. Not only can prudent funding of long-term timber management improve the educational finance scenario in Montana, it can lend stability to the long-term resource base for one of the most important components of the state's economy, its forest products sector.

Following World War II, timber harvesting on Montana's national forests accelerated and peaked about 1970. By 1978, national forest harvests had dropped some 40% below their historical record levels. Following the abrupt downturn in national forest harvesting in Montana, the level of harvesting on some of the large industrial ownerships increased substantially. By 1990, only one of these three large ownerships will be able to maintain their current levels of cutting for a considerable time into the future. There appears to be substantial market opportunities for a prudent expansion of harvests of trust timber. Harvest levels on Montana's national forests are always uncertain and the market opportunities for state timber will depend to some considerable extent on national forest harvesting decisions.

But, any prudent harvest expansion on trust lands must again be consistent with the legal mandates of management. The remainder of this paper charts some guidelines for the development of systematic and comprehensive timber management planning. Rather than stating what the level of harvest and Divison of Forestry's budget should be, the remainder of the paper indicates just how these questions should be answered.

IV. A Timber and Forest Land Investment Portfolio[5]

The essence of trust management is revealed in what is referred to as a timber and forest land investment portfolio (Table 1). Shown in

this table is hypothetical financial information regarding the land and timber assets for forest resources such as those managed by the Division of Forestry.

The table suggests a way of thinking about the assets managed under trust responsibilities. Considerable technical detail goes into estimating the actual numbers which would make up this investment portfolio for Montana's trust forests. These calculations are discussed in a related set of appendices for interested readers.

The table represents a financial inventory of lands and timber. Commonly, forest inventories consist of acres, board feet, age classes of timber, timber species, forest growth and so forth. This table represents an inventory consistent with trust management responsibilities. Each row of the table represents a maturity class of timber and the value of the land the timber is standing on. For instance, the top row of the table represents a group of land and timber which is appreciating at an annual rate of 17.1%. Each subsequent row in the table shows a lower maturity class. The approach to timber management revealed in this table suggests that the current inventory of land and timber consists of some items (investments) which are earning higher annual rates of yield and others which are earning lower annual yields.

Timber represents an "appreciating" asset. The annual yield of each component of the investment portfolio is simply the result of a ratio.

$$\% \text{ current annual yield} = \left[\frac{\text{value of current growth}}{(\text{value of standing timber} + \text{bare land value})}\right] \cdot 100$$

Timber appreciates for several reasons. First of all, of course, timber grows. The percentage rate of board foot growth may be 6 to 7% at

TABLE 1. A Timber and Forest Land Investment Portfolio.

Maturity Class	Value Standing Timber (Mill $)	Value Current Annual Growth (Mill $)	Bare Land Value (Mill $)	% Current Annual Yield
1	7.050	2.679	15.000	17.1%
2	44.800	11.648	35.000	14.6%
3	96.120	13.457	50.000	9.2%
4	43.000	3.870	4.000	8.2%
5	54.000	4.320	5.000	7.3%
6	38.000	2.660	6.000	6.1%
7	34.000	2.040	5.000	5.2%
8	67.000	3.350	4.000	4.7%
9	103.000	4.120	5.000	3.8%
10	14.000	.390	1.400	2.5%
11	2.000	.050	.500	2.0%
12	1.000	-.002	.100	-0.2%
Wet over land with no salable timber	0	0	60.000	
Totals	503.97	48.582	241.000	6.5%*

*Note: If no timber was harvested for a year, the average rate of yield on the entire portfolio would be 6.5% (48.582 : (503.97 + 241.00) = 6.5%. If timber is harvested and the land reforested, the average yield of the timber portfolio will exceed this average yield.

the age of 20 years and the percentage rate of board foot growth typically slows to less than 1% at perhaps an age of 60 to 70 years. But timber appreciates for other reasons which are perhaps even more important than board foot growth itself. As timber grows, individual trees enlarge in size. Large trees cost less to log (per thousand feet) and typically are converted into more valuable wood products. (For example, saw logs are worth more per thousand board feet than post and poles). Additionally, market forecasts indicate that timber demand is increasing over time relative to timber supply. This, too, suggests another reason that timber stands appreciate. The value of current growth should reflect not only board foot growth but also the other size and market forecasts which underly the appreciating nature of timber stands. Commonly, where the percentage rate of board foot growth is less than one percent, increases in tree size and timber demand forecasts can result in real percentage rates of financial yields as high as 3 to 4%.

Methods of forecasting current annual growth are discussed by Merzenich (1979) and Jackson (1983b). The basic question that surfaces from the investment portfolio analysis is which components of the portfolio are the appropriate candidates for timber harvesting and which should be dedicated to further growth? The answer to this question depends in turn on what rate of return can be expected from the school trust fund investments. The yield from the so called Trust and Legacy (T&L) account in 1982 was about 13.17%. A considerable portion of any interest earnings are what economists refer to as an "inflation premium." Since the rates of return on the components in the timber and forest land investment

portfolio are inflationless or "real," the yields from the T&L account must be adjusted for inflation. Appendix I shows the estimated earnings for the T&L account net of inflation. The expected real or inflationless rate of interest on the T&L account is 2.12%.

The components of the investment portfolio that should be harvested are the entries whose real yields are less than 2.12%. These are maturity classes 12 and 13 in the Table 1. The principle is basic to trust management. Timber should be grown until its percentage yield falls to the level of real earnings of the school trust funds. Then the timber should be harvested and the land be rededicated to the next crop of timber. Quite clearly from the hypothetical table, considerable timber can and often is a better investment than is the school trust fund itself. But if trees that are maturing too slowly are not harvested, the schools will not receive the funds that are due them. Likewise, if timber is harvested that is appreciating at rates faster than can be earned in the trust fund, the schools will also be short changed in the long term. In this case, the increase in value due to appreciation is greater than can be earned in the trust fund. The timber and forest land investment portfolio approach underscores the point that there could be both too little harvesting as well as too much harvesting.

A related subject which will receive more discussion in the next section of this paper is harvest scheduling. The real trick in harvest scheduling is to forecast when the maturity classes at the top of the table will age to the extent they enter the bottom or lower rows of the table. For instance, if little or no timber is cut in the present period, no land will be dedicated to the next crop of trees. This will ultimately

influence how much land and timber enters the high yield maturity classes in the future.

The 4th column of Table 1 is called Bare Land Value (BLV). For ranchers, farmers and foresters, the term is somewhat familiar. BLV is land value derived from allocating it to its highest use value. Appendix II shows how BLV is calculated. In order to calculate BLV, one needs the following kinds of information:

(1) How the timber is to be managed,

(2) what it will cost to manage the timber,

(3) stumpage price forecasts,

(4) how long the timber will be grown,

(5) what volumes will be grown.

One needs an estimate of BLV in order to estimate when to cut current stands of timber. Often, existing stands which are wild and unmanaged regarding tree spacing and species composition are not arranged in the optimum manner that will be the case of subsequently regenerated timber stands. BLV is calculated on the basis of the optimum long run management of timber. Knowledge of long run BLV will assist the state in liquidating stands which are not growing as rapidly as can be expected in the long run. This suggests that inadequately stocked wild stands will have somewhat shorter rotations or harvest ages than will be the case of subsequent intensively managed stands.

In summary, considerable information goes into the timber and forest land investment portfolio. One needs information regarding the value of current inventory, the value of forest land and estimates of the value of current growth for various componenets of the inventory.

The investment portfolio represents a snapshot of the current situation and as such is a point of departure for the next topic, harvest scheduling.

V. Harvest Scheduling

The classic harvest scheduling problem is to choose components of the standing inventory for harvest in the light of growth considerations so that there is some long term continuity in timber harvesting. Any administrative organization which manages timber would like to avoid massive changes in the level of harvesting. To some good extent the term "modulated change in harvests over time" is preferred to the characterizations of "boom and bust." These are some fairly important economic issues which support the rationale for modulated change over the boom and bust approach to rapid liquidation of merchantible inventories. Governmental agencies cannot hire and fire employees nearly as rapidly as can say the aerospace industry. The administrative costs of changing the level of harvest (either up or down) are higher in government and these costs must be viewed as constraining the speed at which harvest levels can be adjusted. As a result of the concern with organizational coherence, computer based harvest scheduling algorithms often limit the change in harvest levels between time periods.

Typically, harvest scheduling algorithms estimate the so called "annual allowable cut" for many decades. Since forest growth is dependent in part on the level or intensity of timber management, a related component of scheduling models is the budget for managing timber. Overcutting can result if harvests are based on forecasted budget levels which are higher than actually funded. Harvest schedules should be prepared for

various long term budget levels for the Division of Forestry and cutting levels must be adjusted each biennium in the light of the actual budget.[6]

Since timber receipts are deposited in the trust funds by law, there is no legal foundation for providing equal annual stumpage receipts by attempting to harvest timber in equal annual amounts. Furthermore, there is no legal basis to schedule timber harvests so as to maintain supplies for local sawmills.

Harvest schedules for trust lands should not be designed for perfectly even flow of long term harvests or even "nondeclining even flow" as is the case of the national forests. Harvest schedules should be planned in the light of budget realities and the financial return on land and timber suggested by the portfolio analysis.

If the Division of Forestry receives an adequate budget for the optimum intensity of management of second growth timber, it is most likely that the harvest level can be increased on trust lands. How much the increase can be and when the increases can occur requires systematic statewide management planning. An increase in the harvest of trust timber will lend overall stability to timber supplies in Montana due to the expected diminishing level of harvests on some of the large industrial land ownerships mentioned earlier.

VI. An Inventory System Commensurate with Trust Management

Perhaps the most basic element in the portfolio approach to harvest scheduling is a financial timber inventory system. Before one can estimate the value of land, standing timber and growth, one has to know a considerable amount about the assets. Specifically one needs to know about:

(1) the productivity of various components of the land base,

(2) the terrain and location of land and water bodies so that logging and silvicultural systems can be judged,

(3) what timber is standing on the land and what it is worth,

(4) what the estimated value of growth is for the various components of the inventory.

My colleague, Professor Fred Gerlach, and his graduate students have been developing just such a land and timber inventory system. (See for instance Martin and Gerlach (1981) and Teuber (1983). They have shown that current inventory data collected by the Division of Forestry can be arranged in a computer based mapping system. It is highly probable that this inventory data can be used to develop financial inventories.

The use of computer based inventory information will allow the development of state-wide forest management that is fundamentally realistic. It should be realistic in the sense that specific mappable areas of land and timber are scheduled for management and harvesting. Some state tracts are still inaccessible and there are probably some areas yet where access costs are prohibitive so that stands are financially inoperable. Because a considerable amount of the land is scattered throughout the state, prudent management with limited budgets implies that management be concentrated where the financial returns warrant the costs.

For these reasons, the timber inventory system must be based in terms of biophysical realities and economic ones as well. In order to plot a logical plan of events, one needs to adequately identify the

the starting point. For trust timber management a financial inventory of the land and timber assets which reflects the logging and silvicultural systems to be employed that result from terrain, location and the environment of the sites themselves represents the logical starting point. As management proceeds, uncut timber matures, the inventory system must be updated. The only way to fulfill the spirit of trust management is to use these state-of-the-art techniques.

VII. Summary

In essence, there should be a more systematic way designed to determine the level of harvest, investment and budget for the management of Montana's Forest trust lands. There is little doubt in my mind that this will lead to a substantial increase in timber harvesting on trust lands which is sustainable in the long run. It is fair to suggest that the level of harvesting can actually be doubled over recent levels. Just how long it will take to achieve this higher harvest level will depend on the budgetary committment to intensive management as well as the composition of current timber inventories. The long term impact on educational finance in Montana of expanded harvest receipts would be very favorable. Currently the $150 million trust fund is expanding at about $2,000,000 per year as a result of timber sales. A substantial increase in timber sales revenue will aid in relieving the long term strain on both state aid and property taxes for educational support. The direction of timber management on state lands must be prudent since these lands are so fundamental to Montana's statehood. If comprehensive timber management planning is developed within the confines enumerated in this paper, we can proceed with prudent long term harvest expansion.

FOOTNOTES

[1] The original Enabling Act of 1889 (Public No. 52), 25 Stat. 676; is reproduced in Shannon (1983).

[2] An excellent discussion of the legal framework for trust management in Montana is found in Griffing's (1975) paper on the subject. My discussion of the legal framework is highly dependent upon her paper.

[3] Personal interview with Gary Brown. State Forester, and his assistant, Robert Griffiths, on November 25, 1983.

[4] The discussion of the benefits of PFA are based upon Jackson, David H. (1983a).

[5] The portfolio approach to lands and timber was first developed in a narrowly circulated paper. See Jackson, David H. (1983b).

[6] Several of the current harvest scheduling algorithms, when coupled with even flow constraints, inefficiently schedule timber harvests and stand investments due to an allowable cut effect. See Teeguarden (1973), Montana should avoid these pitfalls.

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APPENDIX I

ESTIMATION OF EXPECTED REAL RATE OF RETURN ON THE SCHOOL TRUST FUND

Records of historical yields on the School Trust Fund are difficult to estimate due to several reasons. Actual fund management was transferred to the State Board of Investment about 10 years ago. Mr. Richard Kain, a portfolio analyst with the Board of Investment, indicates that in recent years, the Trust and Legacy Portfolio has consisted of a mix of 80% corporate bonds and 20% short-term treasury notes. The real rate of return was calculated as if this had been the investment portfolio for the past 20 years. Adjustments for inflation were made using the implicit GNP Deflator. This price index is considered to be the best inflation indicator for the period.

Data* (Data from Annual Economic Report of the President)

	Yields				
Year	US T. Notes New Issues (3 mo)	Corporate Bonds (Moodys Aaa)	Weighted Avg. Yield (80% Bonds 20% T. Notes)	Rate change Implicit GNP Deflator	Real Rate of Earnings (Real Yield)
1982	10.686	13.79	13.17	6.0	7.17
1981	14.077	14.17	14.15	9.4	4.75
1980	11.506	11.94	11.85	9.3	2.55
1979	10.041	9.63	9.71	8.6	1.11
1978	7.221	8.73	8.43	7.4	1.03
1977	5.265	8.02	7.47	5.8	1.67
1976	4.989	8.43	7.42	5.2	2.54

Data Continued

1975	5.838	8.83	8.23	9.3	-1.07
1974	7.886	8.57	8.43	8.8	- .37
1973	7.041	7.44	7.36	5.8	1.56
1972	4.071	7.21	6.58	4.2	2.38
1971	4.348	7.39	6.78	5.0	1.78
1970	6.458	8.04	7.72	5.4	2.32
1969	6.667	7.03	6.96	5.1	1.86
1968	5.339	6.18	6.01	4.4	1.61
1967	4.321	5.51	5.27	3.0	2.27
1966	4.881	5.13	5.08	3.2	1.88
1965	3.954	4.49	4.38	2.2	2.18
1964	3.549	4.40	4.23	1.5	2.73
1963	3.157	4.26	4.04	1.5	2.54
				$\overline{X}$ =	2.124

Thus, the average real yield on this kind of investment portfolio for the past 20 years would be 2.12%. This represents the earnings above inflation. Real rates of interest have been of this order of magnitude for the 20th Century. It is reasonable to expect comparable earnings in the future.

APPENDIX II

DETERMINING BARE LAND VALUE (BLV)

The following table represents the estimation of (BLV) for two different management regimes or scenarios for the same parcel of land. BLV represents the net discounted present value of the expected costs and benefits for growing timber for each alternative management regime. In developing a timber management plan, BLV should be estimated for various land classes. Classifications would be similar lands not only in terms of productivity but also location and logging and silvicultural systems anticipated to be used. Classifications should reflect the broad factors which affect land value. Several realistic management regimes should be investigated for each land class.

The table below shows two such management regimes for Ponderosa Pine production using clearcutting and tractor yarding. The data used was developed by Gibbs, Milner and Ullman (1983) using managed stand growth and yield function developed by Tesch (1980). Tesch's yields are higher than many foresters believe to be realistic for Montana. This is due in part to the fact that Tesch grew site index quality trees and only allowed "competition" mortality. Losses due to insects and diseases are not included by Tesch.

In calculating BLV, all appropriate management costs should be included as either occurring at expected dates or as annual overhead costs. I have used the following costs (in 1972 dollars). Planting and site preparation for 12 x 12 spacing was $93.50/acre. For 8 x 8 spacing, planting and site preparation was $114.00/acre. In lieu of estimating all other management costs for stand manipulation, protection, sale preparation, sale administration, inventories and so forth, I have used a hypothetical figure of $10/acre per year.

BLV is calculated using the following formula and a 2.12% discount rate.

$$BLV = \frac{S - qo(1 + r)^t}{(1 + r)^{t-1}} - \frac{a}{r}$$

where:

s = the forecast stumpage value

qo= the combined site preparation and administration costs (assumed to take place in year of harvest).

r = the real annual discount rate (2.12)

t = time of growth period or rotation length in years

a = annual costs of management

12 x 12 Spacing, 70% survival of initial trees planted

Age (years)	Volume/AC MBF	Forecast Value/MBF	Forecast Value/AC	BLV
35	1.39	0	0	
40	2.84	15.00	42.60	
45	4.58	40.50	185.50	
50	6.45	90.00	580.50	-306.93
55	8.81	120.25	1059.40	-127.40
60	10.17	145.20	1479.85	- 22.26
65	11.98	155.00	1856.90	34.05
70	13.70	162.00	2260.50	62.63
75	15.31	165.00	2526.15	64.81 *
80	16.80	167.00	2805.60	51.22

Note: for 12 x 12 spacing, a rotation of 75 years maximizes land value and investment return.

8 x 8 spacing, 70% survival of initial trees planted

35	0	0	0	
40	4.18	10.00	41.80	
45	7.18	30.00	215.40	
50	10.48	79.00	827.92	-200.81
55	13.88	108.00	1499.04	52.55
60	17.12	127.50	2182.80	234.93
65	20.23	138.00	2777.94	329.73
70	23.17	144.00	3336.48	378.26
75	25.91	148.00	3834.68	387.54
[illegible]	28.44	150.00	4266.00	367.46

Notice in the example that the greater planting investment is warranted. BLV with 8 x 8 spacing is \$387.54/AC versus \$64.81/AC. This is the preferred management regime. After adjusting land values to purchasing power of money for the base year used in the portfolio, the highest BLV should be used to calculate rates of yield for components of the portfolio even if current inventories are not arranged or managed as planned in the long run.

Also notice that the rotation age in the preferred regime is consistent with the investment portfolio (Table 1). The expected yield between the age of 70 and 75 years is 2.68% and the expected yield between age 75 and 80 is 2.04%. The table in the appendix, like the portfolio analysis shows the rotation in light of BLV, growth and stock.

$$\text{average annual value growth age 70 to age 75} = \frac{3834.68 - 3336.48}{5} = 99.64$$

$$\text{average annual value growth age 75 to age 80} = \frac{4266.80 - 3834.68}{5} = 86.26$$

$$\text{\% expected asset yield age 70 to 75} = \frac{99.64}{(3336.48 + 387.54)} = 2.68\%$$

$$\text{\% expected asset yield age 75 to 80} = \frac{86.26}{(3834.68 + 387.54)} = 2.04\%$$

APPENDIX D

COMPARISON
OF
THE COSTS TO ESTABLISH AND MAINTAIN
STATE FOREST FIRE PROTECTION
WITH
THE COSTS TO CONTINUE CONTRACTING FOREST FIRE
PROTECTION WITH THE U. S. FOREST SERVICE

DEPARTMENT OF STATE LANDS

MARCH, 1984

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A. Wildfire Suppression In Montana:

The Department of State Lands is charged by Montana law with the protection of the natural resources of the State from wildfire.(1)* Forest, range and other wildfires in Montana have historically posed a threat to the resources of all property owners. These fires may occur in bunches, with hundreds of fires being ignited by one storm system. These fires ignite in heavily subdivided, as well as very remote areas of the State. Once ignited, these fires can spread rapidly, crossing property boundaries, creating their own mini-weather systems, and destroying natural, as well as man-made resources. The best method to combat these fires once ignited, is through an organized system to rapidly detect and initial attack the fires, with large enough forces to insure control.

B. Benefits:

The benefits from the suppression of these fires are:

1. A sustained yield of forest products at a time and amount that will best benefit the landowner, local industry and the State in general.

2. A sustained, even flow of useable water for agricultural, industrial, residential, and other uses.

3. A wide range of wildlife habitat that enhances the recreational opportunities for both in-state and out-of-state residents.

4. Reduced airborne particulates and improved air quality.

5. Aesthetically pleasing surroundings for a wide range of uses, including recreational (hiking, camping, etc) or subdivision for forest home settings.

A study of the values at risk from fire in Montana in 1972 resulted in the following values. The cost figures shown have been updated to 1983 values:

FIGURE #1

Timber	$ 5,302,331,000
Water	1,459,236,000
Recreation	2,185,911,000
Wildlife	627,272,000
Forage	1,930,995,000
Real & Personal Property	1,072,745,000
Total Value	$12,758,490,000

* The numbers in parentheses refer to the corresponding attachment, see pages 15 to 34.

C. Wildfire Suppression Versus Use of Prescribed Fire:

Due to the ability of fires to spread rapidly across property boundaries, wildfires on State and private lands in Montana are required to be suppressed. If fire is to be used to improve a habitat or cover type, that fire must be carefully planned, with ignition and spread carefully monitored and controlled based on the most current state-of-the-art in prescribed fire. Wildfires on intermingled ownerships should not be allowed to burn, hoping they will somehow magically do more good than damage. Wildfires should continue to be rapidly suppressed. Prescribed fire should be used only where it is necessary to meet specific land use objectives, with ignition and control carefully planned and monitored.

The current fire protection system was designed in recognition of the fact that few individual landowners are able to maintain the necessary forces to rapidly detect, attack, control and extinguish large forest fires which burn in heavy fuels on mountainous terrain over long periods of time. Without the forest fire protection system, we would be back at a time when millions of acres of forests burned in one summer, homes were burned, lives were lost, entire towns evacuated, whole watersheds denuded.

D. Organization of Protection Units:

The forest land in Montana is classified for fire protection purposes.(2) The State and privately owned forest land covers 12.5 million acres.(3) The non-forest lands amount to approximately 50 million acres. The State, counties and private landowners are responsible for providing protection against the ignition and spread of wildfires within the State. Several means are available for each to separately, or jointly, meet their wildfire protection obligations.

1. Forest Fire Districts: Districts are formed by a favorable vote of 51% of the forest landowners owning 51% of the land within a given area.(4) The vote is a method used by landowners to recognize the need for organized wildfire protection beyond that which they can individually provide, and to request assistance from the State in providing forest fire suppression resources.

2. Affidavits: Individual forest landowners outside of districts may request protection from the State if a recognized protection agency agrees to accept the area. The landowner signs an affidavit agreeing to pay the fee as established by State law.(5) Both the forest fire districts and affidavit units are designed for those areas that normally require more than local forces to suppress wildfires.(6)

3. State-County Cooperative: Counties may join with the State in organizing, training, equipping and supporting local volunteers in suppressing wildfires.(7) Thirty-five counties have elected to join this system.(8) It is designed for those areas of the State where the fuels are lighter, and the types of fires more readily lend themselves to suppression by local forces.

4. Self Protection: Landowners not protected by a forest fire district, affidavit, or State-County cooperative, must provide self protection against the ignition or spread of fires.(9) The county statutes for fire protection are permissive and do not mandate that the county must provide assistance to the landowner.(10)

   Landowners may form rural fire districts or volunteer fire companies to aid them in fire protection.(11) These groups do a good job of initial attacking wildfires, but they normally lack the resources to suppress a fire if it becomes very large, and burns into heavy fuels or rough topography. These fires then become a matter for local government or State concern as a local emergency.

E. Payment for Protection Services:

As with the partnership role in wildfire suppression on State and private lands, so has the funding remained a partnership of private, State and federal funds.(12) This partnership in payment has been based on the combination of benefits received by each party, the need for protection on State lands and on the public fire threat to private lands and resources.

1. Funding for Forest Fire Districts and Affidavits: Private funding levels have been pegged at 33%± of the normally budgeted expenses for protection of these lands. Suppression supplemental costs and the remaining two thirds of the normal operating budget have come from State and federal sources. The private share was derived from an analysis of the Battelle Institute study report of 1958. The Battelle Memorial Institute reviewed this issue of benefits and concluded:

   > "The private share should be at least 16% and the public share should be divided consistently with the following: 25 to 44% State and 59 to 40% Federal."(13)

   The ratio between the 16% private share and the 33%± State share, was used to arrive at 1/3 private, 2/3 public funding.

   It would appear that due to an increase in forest home subdivisions, increased reliance on forest watersheds by downstream users, heavy wildlife and other associated recreational activities by non-forest landowners; that the benefits to the general public have probably increased in proportion to those for the private landowner since 1958.

   The private landowner many times must pay for fire protection services simply to protect himself from the general public. Over the past 7 years, 86% of the fires on State protected areas were caused by other than the forest landowner or his agent.

Private forest landowners and the forest industry provide other services in addition to an annual assessment fee. These include:

Firefighters
- Ranch Hand
- Mill Hand
- Water Tender
- Forester

Equipment
- Tractors and Plows
- Chainsaws
- Dozers and [illegible]

Road Access

2. State-County Cooperative Program: Counties that desire to enter this program are required to secure legislative approval, along with legislative funding for the State's share of the program. The State and county sign an agreement, and then assist each other in providing local volunteers with the assistance needed to adequately attack and suppress wildfires.(7) Each agency agrees annually to support its share of the program. All State and private lands outside of forest fire districts and affidavits are then protected.

   The State portion of the program is funded by the General Fund. The county normally supports its share of the program through a wide variety of means: [illegible] county fire funds,(14) local fire district funds, local benefits and bake sales, volunteer labor and materials, county equipment and manpower, ranchers and farmers, etc.

3. State Funding Sources

   a. General Fund and KII: These funds are used to support the forest fire districts and affidavits, the State portion of the cooperative County program, and the air-quality smoke management and prescribed fire programs on State lands. Using State general funds recognizes the public benefits from the protection of the forest natural resources, the need for protection of State owned lands, and also recognizes the public threat to natural resources on private lands.

   b. Private Landowner Assessments: Landowner assessment rates are currently set at a maximum of 16 cents per acre with a 6 dollar minimum fee.(15) This source normally accounts for approximately one-third of the normal operating budget for districts and affidavit units. 4,835,006 acres with 37,216 landowners are currently contributing through this fee system.

c. Federal Funds:

i) Rural Fire Prevention & Control (RFP&C) Funds: This fund in past years was referred to as the Clarke-McNary Section 2 Program. The program was designed to assist states in establishing adequate levels of wildfire protection. The funding has not kept up with inflation or with the increases in public pressures on forest lands. RFP&C funds in the 1984 budget amount to $234,000 compared to $219,000 ten years ago. This amounts to a 52% decrease in real dollars without considering increases in protection needs.

ii) Federal Contracts: The State protects federal lands and receives a equivalent payment per acre to that paid to federal agencies for protecting State and private lands. These funds constitute only 3% of the current budget.

iii) Rural Community Fire Protection (RCFP) Program: These are pass-through grants in the annual amount of about $59,000 for communities under 10,000 population to organize, equip and train firefighters to suppress rural fires.(16)

iv) Federal Emergency Management Agency (FEMA) Funds: The State may apply for emergency fire funds to suppress fires that threaten to constitute a major emergency in the State. These funds, if received, are returned to the State General Fund to replace State fire supplemental funds. The Department has applied for and received funds under this program to replace State suppression monies on several fires.

d. Fire Billings: Fires which are ignited and not controlled in accordance with State statutes, and which produce State fire suppression expenditures result in billings to the landowner or person igniting the fire. Monies received are returned to the State General Fund. The amount collected from fire billings fluctuates drastically from year to year (i.e., a high of $430,916 collected in 1977 to a low of $3,375 collected in 1978 in the past 9 years).

F. USFS Position:

The U.S. Forest Service currently protects 1.9 million acres more of State and private lands, than those Federal lands protected by the State. The State pays the Forest Service about 16 cents per acre for this service. The Forest Service has taken a position that it must recover its "full costs" for protection of these lands.(17) This position resulted in a letter from the Regional Forester stating his intent to begin charging USFS "full costs" unless the 1.9 million acre imbalance was eliminated.

The Department of State Lands presented this situation to the last legislative session, with an analysis of the effects if the USFS "full costs" remained at that level.(18) The 1983 legislature proceeded to fund the first reduction block at Libby.(19)

Since the 1982 letter, USFS "rates" have reduced substantially due to several abnormally easy fire years. This raises the question as to whether the State should proceed with the reduction process or simply pay the USFS "rate". Before analyzing the current status, a closer look is needed at the two terms: "rate" and "full cost".

G. USFS "Rate" and USFS "Full Cost":

The USFS "rate", that has been quoted as an acceptable payment from the State to receive Forest Service protection services on State and private lands, does not constitute USFS "full costs". However, their correspondence refers to recovery of their "full costs".(17) The current "rate" is calculated using federal fiscal manual instructions that can, and do, change (i.e., the recent change in how they calculate suppression averages). Federal pressures to reduce their involvement on State and private lands have resulted in a real dollar drop in State fire support dollars of 52% in the last 10 years. These same pressures may be brought to bear on the Forest Service to recover more and more of their "full costs". The "rate" that is currently quoted could increase rather sizably just due to a change in the federal fiscal manual instructions on how to calculate rates. The need to reduce federal deficits could result in this type of action in the near future.

For example, if the Forest Service is currently collecting 60% of their "full costs" in their quoted "rate", then an increase of $516,450 could result in one year ($1,032,900 per biennium) due to a simple change in manual instructions.

The Forest Service "rates" do fluctuate rapidly and do change a significant amount annually. The following "rate" changes show what has occurred over a one or two year period of time:

FIGURE #2

In 1 Year	Fluctuation
Lolo National Forest	+ 8¢ per acre
Helena National Forest	+ 8¢ per acre
Lewis & Clark National Forest	- 9¢ per acre
Gallatin National Forest	+10¢ per acre
Flathead National Forest	+11¢ per acre
In 2 Years	
Regionwide	+13¢ per acre

An increase of 13 cents per acre on the current imbalance equals $203,450 per year ($406,900 per biennium).

In calculation of USFS "rates", the Forest Service uses a system of averaging to arrive at an annual suppression cost. The past seven years cost figures are used, with the high year and the low year dropped out, and then the remaining five years totaled and averaged. The recent easy years experienced by the Forest Service, have resulted in what we feel to be a non-typical situation in their cost calculations.

To determine whether this may be the case, we have examined two aspects of the Forest Service costs: first--their annual "rates" for previous years; and, second--their suppression cost per fire. The following lists the information concerning these two items:

1. Annual "rates" for Previous Years (In '83 dollars)

FIGURE #3

Year	"Rate"/Ac.	Implicit Price Deflator	"Rate"/Acre in 83 dollars
1974	$0.63	1.874	$ 1.18 (high)
1975	0.45	1.714	.77
1976	0.44	1.629	.72
1977	0.40	1.540	.62
1978	0.45	1.434	.65
1979	not available	---	not available
1980	0.51	1.207	.62
1981	0.57	1.103	.63
1982	0.43	1.039	.45 (low)
1983	0.47	1.000	.47
			$0.64 (avg.7 yrs)

Averaging the USFS "rate", throwing out the high and low year, results in an average of 64 cents per acre.

2. Cost of Suppression per Fire: Using Forest Service figures for the numbers of fires suppressed, and their suppression costs on a five year average, the Forest Service cost of suppressing each fire amounts to $4,370. The State average for suppressing each State fire on the same basis amounts to $1,413.

What this indicates is that if the Forest Service experiences several high fire incidence years, they will spend about 3.1 times as much per fire to suppress fires on State, private and federal lands, than if the State fought the same fires. These increased costs by the Forest Service for fighting fires on State, private and federal lands will be passed on to the State in their "rate" per acre calculation.

One other advantage enjoyed by the State, is the use of Federal Emergency Management Agency (FEMA) funds to offset fire suppression costs on large, potentially disasterous fires. The Forest Service cannot utilize this fund. FEMA support was used by the State in paying for the Barker Creek fire near Anaconda. If the Forest Service had fought the Barker Creek fire instead of the State, an additional $368,474 would have been passed on to the State and landowners in the USFS "rate".

In summary, the USFS quoted "rate" does not include their "full costs", and the "rate" can change quickly and fluctuate to a large amount. The Forest Service expends 3 times as much as the State to suppress each fire. An analysis of all of these factors, along with a comparison of the current USFS "rate" against their historical average, appears to strongly favor State protection.

H. Comparison of Costs:

The USFS currently quoted "rate" for fire protection services is forty-seven cents per acre. In the letter sent in 1982, sixty-six cents per acre was quoted.(17) At the sixty-six cent rate, the choice as to reduce or not reduce the Forest Service contract was clearly in favor of a reduction. What effect does the new lower "rate" have on this process?

1. Changes to State budget if the reduction is continued:

FIGURE #4

FY	Prevention & Presuppression	Suppression	USFS Contract	Income
'84	+$292,000			
'85		+$28,000	-$28,000	
'86	+ 217,000			(-$51,000)
'87		+ 28,000	- 79,087	
'88	+ 217,000			
'89		+ 28,000	- 79,087	
'90	+ 217,000			
'91		+ 28,000	- 79,087	
'92	+ 217,000			
'93		+ 28,000	- 79,089	
	+$1,160,000	+$140,000	-$344,348	(-$51,000)

Budget increase over 10 years: +$904,652

The above chart indicates those additions or deletions that would occur in the State budget to accomplish all 5 blocks of reduction. The State budget would be increased by $904,652 over 10 years to accomplish the reduction. $292,000 of this amount has already been accomplished at Libby, leaving $612,652 remaining to be funded.

a. Prevention and Presuppression: Specific fire plans will be drafted for the remaining 4 blocks of reduction. These plans will specify the FTE's and funds necessary to establish State protection. The Libby block was funded at $292,000 for '84 and '85. In '86 and '87, $33,000 will be shifted from the Libby appropriation to block 2, added to the $217,000 shown for a total of $250,000 to establish protection on block 2. In '88 and '89,33,000 will be shifted forward to block 3 and so on. At the end of the process, $30,000 would be used for capital equipment replacement for all of the 5 block area.

b. Suppression: A figure of $28,000 has been added each two years as the estimated increase, on the average, for suppression costs due to an increased number of fires. This figure was derived by using actual USFS figures for numbers of fires they have experienced per year, and multiplying that number of fires times the State suppression costs per fire. This increase in suppression funding is the annual average increase normally funded through the fire suppression supplemental.

c. USFS Contract and Income: The reductions in USFS contract dollars and income to the State still have to be negotiated with the Forest Service. Shown in Figure #4 is our best educated guess as to how this reduction will be carried out.

2. State Budget: Applying the additions and deletions spelled out in Figure #4, the State budget figures would be as follows:

FIGURE #5

FY	Fund State
'84	$ 3,137,633
'85	3,137,633
'86	3,303,633
'87	3,252,546
'88	3,469,546
'89	3,418,459
'90	3,635,459
'91	3,584,372
'92	3,801,372
'93	3,750,283
10 Year Total	$34,490,936

3. State Budget versus Payment to USFS: A comparison of what it would cost to fund the State and complete the reduction process, against what it would cost to contract with the Forest Service over the same 10 year period is as follows:

FIGURE #6

FY	Fund State	Pay 47¢ Rate*
'84	3,137,633	3,491,673
'85	3,137,633	3,491,673
'86	3,303,633	3,491,673
'87	3,252,546	3,491,673
'88	3,469,546	3,491,673
'89	3,418,459	3,491,673
'90	3,635,459	3,491,673
'91	3,584,372	3,491,673
'92	3,801,372	3,491,673
'93	3,750,283	3,491,673
10 Year Total	$34,490,936	$34,916.730

These figures indicate that over a 10 year period, the State could complete the reduction process with slightly less expenditure (approximately $425,994 savings) than paying the 47 cents per acre rate.

* (Federal acres: 1,920,000 USFS + 164,000 BIA times 31 cent increase and added to current level.)

4. Cost to Maintain State Protection: Figure #6 indicates that the cost to maintain State protection in FY'93 would be $3,750,283 per year. This cost would then carry forward to '94 and '95, etc. Retaining Federal protection at costs of 47 cents per acre would result in increased costs of $425,994 over the 10 year period, but the '93 cost ($3,491,673) would be $258,610 less than State Funding.

Using "rates" obtained from the Forest Service and updating them to real 1983 dollars, the Forest Service annual average "rate" has been 64 cents per acre for the last 10 years (Figure #3).

If we apply the Forest Service average "rate" of 64 cents per acre or the "rate" quoted in the 1982 letter of 66 cents, we find the following:

FIGURE #7

64 cent average "rate"	=	$3,845,633 annual cost
66 cent "rate"	=	$3,887,633 annual cost
State Cost	=	$3,750,283 annual cost

The cost for maintaining State protection in FY '93 ($3,750,283) would be $95,350 less per year than paying the 64 cent rate ($3,845,633). Since this has been the Forest Service's past average "rate", we see no reason why their future "full costs" would not match, or exceed that total.

5. Conclusions:

a. The Forest Service will be pressured towards collection of "full cost" in their "rates".

b. At the 66 cent "rate" quoted in 1982, the State would have saved $4,498,514 over 10 years by establishing State protection rather than paying the Forest Service, and would have saved $137,562 every year thereafter.

c. At the 47 cent "rate", the State would save $425,994 over 10 years by establishing State protection, but would be paying $258,610 more per year if the "rate" remained at 47 cents.

d. Forest Service "rates" will undoubtedly drift back towards their last 10 year average of 64 cents.

e. If Forest Service "rates" move back towards their normal of 64 cents per acre, then the State would save an additional $95,350 per year by reducing the Forest Service contract and by staying with State protection.

I. Funding Options

1. Assessment Funds - Table of Values: An increase of 1 cent per acre in the maximum fee of 16 cents will generate about 40,000 dollars of income, and an increase of 1 dollar in the minimum fee of 6 dollars will generate about 30,000 dollars of income. The current process will collect about 750,000 dollars at the 16 cent and 6 dollar maximum.

FIGURE #8

Increase in Rate		Increase in Minimum	
+1¢ = 17¢	$40,000	+$1 =$ 7	$30,000
2 = 18	80,000	2 = 8	60,000
3 = 19	120,000	3 = 9	90,000
4 = 20	160,000	4 = 10	120,000
5 = 21	200,000	5 = 11	150,000
6 = 22	240,000	6 = 12	180,000
7 = 23	280,000	7 = 13	210,000
8 = 24	320,000	8 = 14	240,000
9 = 25	360,000	9 = 15	270,000
10 = 26	400,000	10 = 16	300,000
11 = 27	440,000	11 = 17	330,000
12 = 28	480,000	12 = 18	360,000
13 = 29	520,000	13 = 19	390,000
14 = 30	560,000	14 = 20	420,000
15 = 31	600,000	15 = 21	450,000
16 = 32	640,000	16 = 22	480,000
17 = 33	680,000	17 = 23	510,000
18 = 34	720,000	18 = 24	540,000
19 = 35	760,000	19 = 25	570,000
20 = 36	800,000	20 = 26	600,000
21 = 37	840,000	21 = 27	630,000
22 = 38	880,000	22 = 28	660,000
23 = 39	920,000	23 = 29	690,000
24 = 40	960,000	24 = 30	720,000
25 = 41	1,000,000	25 = 31	750,000
26 = 41	1,040,000	26 = 32	780,000
27 = 42	1,080,000	27 = 33	810,000
28 = 43	1,120,000	28 = 34	840,000
29 = 44	1,160,000	29 = 35	870,000
30 = 45	1,200,000	30 = 36	900,000
31 = 46	1,240,000	31 = 37	930,000
32 = 47	1,280,000	32 = 38	960,000
33 = 48	1,320,000	33 = 39	990,000
34 = 49	1,360,000	34 = 40	1,020,000
35 = 50	1,400,000	35 = 41	1,050,000

2. Assessment Collections at Varying Percentages to Fund a Reduction in Federal Protection: The following table indicates the changes that would be needed in the assessment rates for various percentages of Assessment Funding:

FIGURE #9

FY		
'84	$2,845,633	(without Libby)
'93	3,750,283	(with 5 Blocks)
	+$ 904,652	Total Increase in Funding for 5 Blocks
	- 103,130	11.4 for 549,000 Acres of State Lands
	$ 801,552	Subtotal
	- 140,000	Average Suppression Supplemental
	+$ 661,522	Assessment Collection Increase at 100

Increase to Assessments	Percentages				
	100%	80%	60%	40%	20%
Need to Collect	$ 661,522	529,217	396,913	264,608	132,304
Max Rate (16¢) & Min Fee ($6)	34¢ & $6	31¢ & $6	27¢ & $6	24¢ & $6	21¢ & $6
	or:	or:	or:	or:	or:
Max Rate (16¢) & Min Fee ($6)	16¢ & $30	16¢ & $26	16¢ & $21	16¢ & $17	16¢ & $12
FY '93:					
Assessments	$1,350,873	1,218,568	1,086,264	953,959	821,655
General Fund	2,067,104	2,199,409	2,331,713	2,464,018	2,596,322
Other Funds	332,306	332,306	332,306	332,306	332,306
Total	$3,750,283	3,750,283	3,750,283	3,750,283	3,750,283

J Other Concerns

1. Possible Effect of Assessment Increase: One side effect of a large increase in assessment rates (Figure #9) could be the cancellation of affidavits by landowners covering some 454,229 acres of forest land. This would place an additional burden on counties and local landowners. The State would undoubtedly be involved in the future in some very large fires since the local forces probably would not be able to suppress fires in these areas during overload conditions. The State's added suppression costs could far outweigh the added income from a higher assessment rate.

2. Recreational Fires: About 14.4% of all wildfires on State and private lands are associated with recreational activities. This is approximately the same percentage as those ignited by forest landowners. A recreational fire protection fee is not currently collected.

3. Changes in Forest Fire Districts: Forest fire districts are formed by a favorable vote of 51% of owners covering 51% of the forest land. Allowing individual owners within these districts to withdraw after the vote, would disrupt the entire fire protection system. If the protection is deemed unnecessary, then a procedure should be established to abolish the entire district along with some guarantee to the State that State emergency fire services would no longer be needed within that area. It is questionable whether insurance companies would insure against timber loss and fire suppression costs if the landowner has rejected fire protection services covering forest land.

4. Federal Funds: Federal funds continue to decline and arrive so late in the State fiscal year as to create problems for State fiscal agents. The State should consider providing general funds for this amount, with the federal monies reverting to the General Fund upon receipt by the State.

5. Fire Billings: Continued organization, training and equipping of local forces by the State aids the State in maintaining reduced suppression costs. The Rural Community Fire Protection (RCFP) program provides $59,000 annually for this purpose to cover about $400,000 in applications. Monies collected by the State for fires caused by negligence, etc. are deposited in the General Fund. "Plowing" a portion of these funds annually back into the RCFP program would provide long range benefits in keeping fire suppression costs at a minimum. The legislature may wish to authorize utilizing up to a full matching amount ($59,000 in '85) if collected in billable fires.

ATTACHMENTS

76-11-101. Protection of natural resources from fire. The department of state lands, under such rules as the state board of land commissioners may provide, shall protect the natural resources of the state, especially the natural resources owned by the state, from destruction by fire and for such purpose, in emergencies, may employ men and incur other expenses when necessary.

History: En. Sec. 14, Ch. 147, L. 1909; re-en. Sec. 1836, R.C.M. 1921; re-en. Sec. 1836, R.C.M. 1935; amd. Sec. 1, Ch. 220, L. 1955; amd. Sec. 105, Ch. 253, L. 1974; amd. Sec. 18, Ch. 397, L. 1977; R.C.M. 1947, 81-1415; amd. Sec. 1, Ch. 529, L. 1981.

76-11-102. Cooperative agreements with owners and lessees of land for fire protection and conservation. (1) For the purpose of more adequately promoting and facilitating the cooperation, financial and otherwise, between the state and all of the public and private agencies or individuals therein, the department of state lands may cooperate with owners or lessees of farm, range, forest, watershed, or other uncultivated lands in private and public ownership for the protection from fire of the cultivated agricultural crops or natural resources existing or growing thereon and also in the conservation and perpetuation of such lands and resources, including the prevention of soil erosion and the regulation of stream flow.

(2) The state treasurer is hereby authorized to receive money that may be appropriated or allotted for the purposes named in subsection (1) by the state, counties, municipalities, the United States government or any department thereof, or other organization or individual.

History: (1)En. Sec. 9, Ch. 179, L. 1925; re-en. Sec. 1830.9, R.C.M. 1935; amd. Sec. 1, Ch. 193, L. 1947; amd. Sec. 101, Ch. 253, L. 1974; Sec. 81-1409, R.C.M. 1947; (2)En. Sec. 10, Ch. 179, L. 1925; re-en. Sec. 1830.10, R.C.M. 1935; amd. Sec. 216, Ch. 147, L. 1963; Sec. 81-1410, R.C.M. 1947; R.C.M. 1947, 81-1409, 81-1410; amd. Sec. 1, Ch. 529, L. 1981.

76-13-104. Functions of department. (1) The department may give technical and practical advice concerning forest, range, water, and soil conservation and the establishment and maintenance of woodlots, windbreaks, shelterbelts, and forest fire protection.

(2) The department shall cooperate with all public and other agencies in the development, protection, and conservation of the forest, range, and water resources in this state.

History: En. Sec. 6, Ch. 128, L. 1939; amd. Sec. 5, Ch. 253, L. 1974; amd. Sec. 3, Ch. 397, L. 1977; R.C.M. 1947, 28-106(1), (4), (6); amd. Sec. 4, Ch. 529, L. 1981.

76-13-201. Duty of owner to protect against fire. (1) An owner of forest land classified as such by the department shall protect against the starting or existence and suppress the spread of fire on that land. This protection and suppression shall be in conformity with reasonable rules and standards for adequate fire protection adopted by the board.

(2) If the owner does not provide for the protection and suppression, the department may provide it at a cost to the landowner of not more than 16 cents per acre per year and not less than $6 per owner per year in each protection district. The owner of the land shall pay to the county treasurer of the county in which the land is situated the charge for the same approved by the department in accordance with this part and part 1.

(3) No other charges may be assessed those landowners participating except in cases of proven negligence on the part of the landowner or his agent.

History: En. Sec. 9, Ch. 128, L. 1939; amd. Sec. 2, Ch. 141, L. 1941; amd. Sec. 1, Ch. 188, L. 1955; amd. Sec. 1, Ch. 91, L. 1959; amd. Sec. 1, Ch. 148, L. 1967; amd. Sec. 1, Ch. 252, L. 1974; amd. Sec. 6, Ch. 253, L. 1974; amd. Sec. 4, Ch. 397, L. 1977; R.C.M. 1947, 28-109.

76-13-202. Means by which department may provide protection. The department may provide for forest fire protection of any forest lands through the department or by contract or any other feasible means, in cooperation with any federal, state, or other recognized agency.

History: En. Sec. 6, Ch. 128, L. 1939; amd. Sec. 5, Ch. 253, L. 1974; amd. Sec. 3, Ch. 397, L. 1977; R.C.M. 1947, 28-106(2).

77-5-103. Role of department. (1) The department shall, under the direction and control of the board, do all the field work in the selection, location, examination, appraisement, and reappraisement of state timberlands.

(2) It shall do all acts required of it by the board, and under the direction of the board it has general charge of the timberlands of the state.

(3) It shall, under the supervision of the board, execute all matters pertaining to forestry within the jurisdiction of the state; have charge of all firewardens of the state and direct and aid them in their duties; direct the protection, improvement, and condition of state forests; take such action as is authorized by law to prevent and extinguish forest, brush, and grass fires; enforce the laws pertaining to forest and brushcover lands and prosecute for any violation of those laws.

(4) The department shall establish and maintain forest fire control training programs for state firefighters and other persons requiring training.

History: En. Sec. 10, Ch. 147, L. 1909; amd. Sec. 2, Ch. 118, L. 1911; re-en. Sec. 1831, R.C.M. 1921; re-en. Sec. 1831, R.C.M. 1935; amd. Sec. 1, Ch. 218, L. 1955; amd. Sec. 34, Ch. 93, L. 1969; amd. Sec. 102, Ch. 253, L. 1974; amd. Sec. 16, Ch. 397, L. 1977; R.C.M. 1947, 81-1411; amd. Sec. 1, Ch. 529, L. 1981.

77-5-104. Firewardens. (1) The department shall appoint firewardens in such number and localities as it considers necessary.

(2) The supervisors and rangers of the federal forest lands within this state, whenever they formally accept the duties and responsibilities of firewardens, may be appointed firewardens.

(3) The following are firewardens but may not receive any additional compensation by reason of the duties hereby imposed:

(a) sheriffs;

(b) undersheriffs;

(c) deputy sheriffs;

(d) state fish, wildlife, and parks wardens;

(e) the state fish, wildlife, and parks director;

(f) members of the board of natural resources and conservation;

(g) the director of the department and employees of the department designated by him;

(h) officers of organized forest protection districts;

(i) members of the Montana highway patrol;

(j) officers of the national park service residing in Montana; and

(k) officers of the bureau of Indian affairs.

(4) The firewardens shall promptly report all fires to the department, take immediate and active steps toward their extinguishment, report any violation of forest laws, and assist in apprehending and convicting offenders.

History: En. Sec. 11, Ch. 147, L. 1909; re-en. Sec. 1833, R.C.M. 1921; re-en. Sec. 1833, R.C.M. 1935; amd. Sec. 1, Ch. 147, L. 1955; amd. Sec. 103, Ch. 253, L. 1974; amd. Sec. 17, Ch. 17, L. 1977; R.C.M. 1947, 81-1412; amd. Sec. 2, Ch. 218, L. 1979; amd. Sec. 1, Ch. 529, L. 1981.

76-13-107. Classification of forest lands. The department may classify the forest land areas of the state for which conservation and fire protection measures are reasonably required and change or modify the classification from time to time as in its judgment is proper.

History: En. Sec. 6, Ch. 128, L. 1939; amd. Sec. 5, Ch. 253, L. 1974; amd. Sec. 3, Ch. 397, L. 1977; R.C.M. 1947, 28-106(3).

76-13-102. Definitions. Unless the context requires otherwise, in this part and part 2 the following definitions apply:

(1) "Board" means the board of land commissioners provided for in Article X, section 4, of the Montana Constitution.

(2) "Conservation" means the protection and wise use of forest, forest range, forest water, and forest soil resources in keeping with the common welfare of the people of this state.

(3) "Department" means the department of state lands provided for in Title 2, chapter 15, part 32.

(4) "Forest fire" means a fire burning uncontrolled on forest lands.

(5) "Forest fire protection" means the work of prevention, detection, and suppression of forest fires and includes training required to perform those functions.

(6) "Forest fire season" means the period of each year beginning on May 1 and ending on September 30, inclusive.

(7) "Forest fire protection district" means a definite forest land area, the boundaries of which are fixed and wherein forest fire protection is provided through the medium of an agency recognized by the board.

(8) "Forest land" means land which has enough timber, standing or down, slash, or brush to constitute in the judgment of the department a fire menace to life or property. Grassland and agricultural areas are included when those areas are intermingled with or contiguous to and no further than one-half mile from areas of forest land.

(9) "Lands" for conservation purposes means all forest lands within this state which are officially classified by the department as forest lands under 76-13-107.

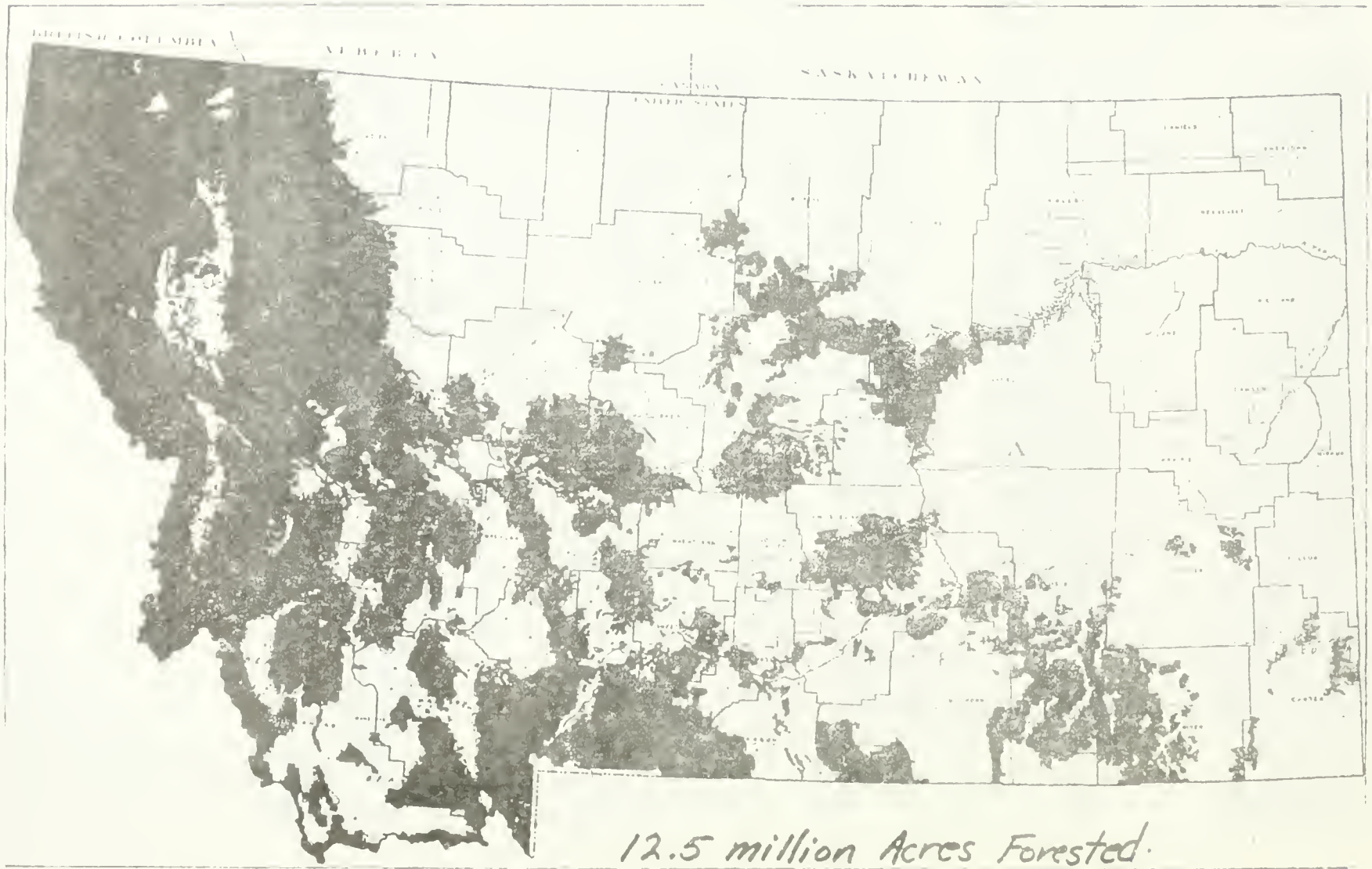
(10) "Owner" means the person, firm, association, or corporation having the actual, beneficial ownership of forest land or timber other than an easement, right-of-way, or mineral reservation.

(11) "Recognized agency" means an agency organized for the purpose of providing forest fire protection and recognized by the board as giving adequate fire protection to forest lands in accordance with rules adopted by the board.

History: En. Sec. 3, Ch. 128, L. 1939; amd. Sec. 1, Ch. 216, L. 1955; amd. Sec. 1, Ch. 93, L. 1959; amd. Sec. 1, Ch. 30, L. 1971; amd. Sec. 2, Ch. 253, L. 1974; amd. Sec. 1, Ch. 397, L. 1977; R.C.M. 1947, 28-103(part); amd. Secs. 1, 2, Ch. 529, L. 1981.

The black areas on this map indicate the forest land areas in Montana classified for forest fire protection by the State. In addition to the federal ownerships, the classified areas include 12,527,469 acres of State and privately owned lands.

1965



12.5 million Acres Forested.
9.4 million Acres Protected.

ATTACHMENT #3

76-13-204. Creation of forest fire protection districts. (1) The board may create forest fire protection districts. Before a district is created, the board shall hold a hearing in any county in which the proposed district or a part thereof is included and the department shall give notice of the hearing at least 20 days in advance thereof to all owners to be affected by the proposed district. Service of the notice may be made by registered or certified mail or by publication in a newspaper published in the county in which the hearing is to be held or, if no newspaper is published in the county, then in a newspaper having a general circulation therein.

(2) A forest fire protection district may not be created unless approved in writing by vote of not less than 51% of the owners representing at least 51% of the acreage to be involved in the proposed forest fire protection district.

History: En. Sec. 5, Ch. 128, L. 1939; amd. Sec. 1, Ch. 90, L. 1959; amd. Sec. 1, Ch. 83, L. 1963; amd. Sec. 1, Ch. 149, L. 1967; amd. Sec. 4, Ch. 253, L. 1974; amd. Sec. 2, Ch. 397, L. 1977; R.C.M. 1947, 28-105(1).

AFFIDAVIT

STATE OF MONTANA
County of ..... } SS.

_____, being first duly sworn, deposes and says:

That he is the owner of forest land/timber on forest land so classified as such by the Department of State Lands, Division of Forestry, and further described as follows:

That he is unable to furnish protection thereon against the starting or existence or to suppress the spread of fire during the full period of each forest fire season defined by 76-13-102 M.C.A.

That should he become able to protect against and suppress fires on such land, he will promptly notify the Administrator, Division of Forestry, thereof, and consents that the assessment under 76-13-102 M.C.A., may be levied for the calendar year in which such notification is made.

_____

Subscribed and sworn to before me this_____ day of _____, 19_____.

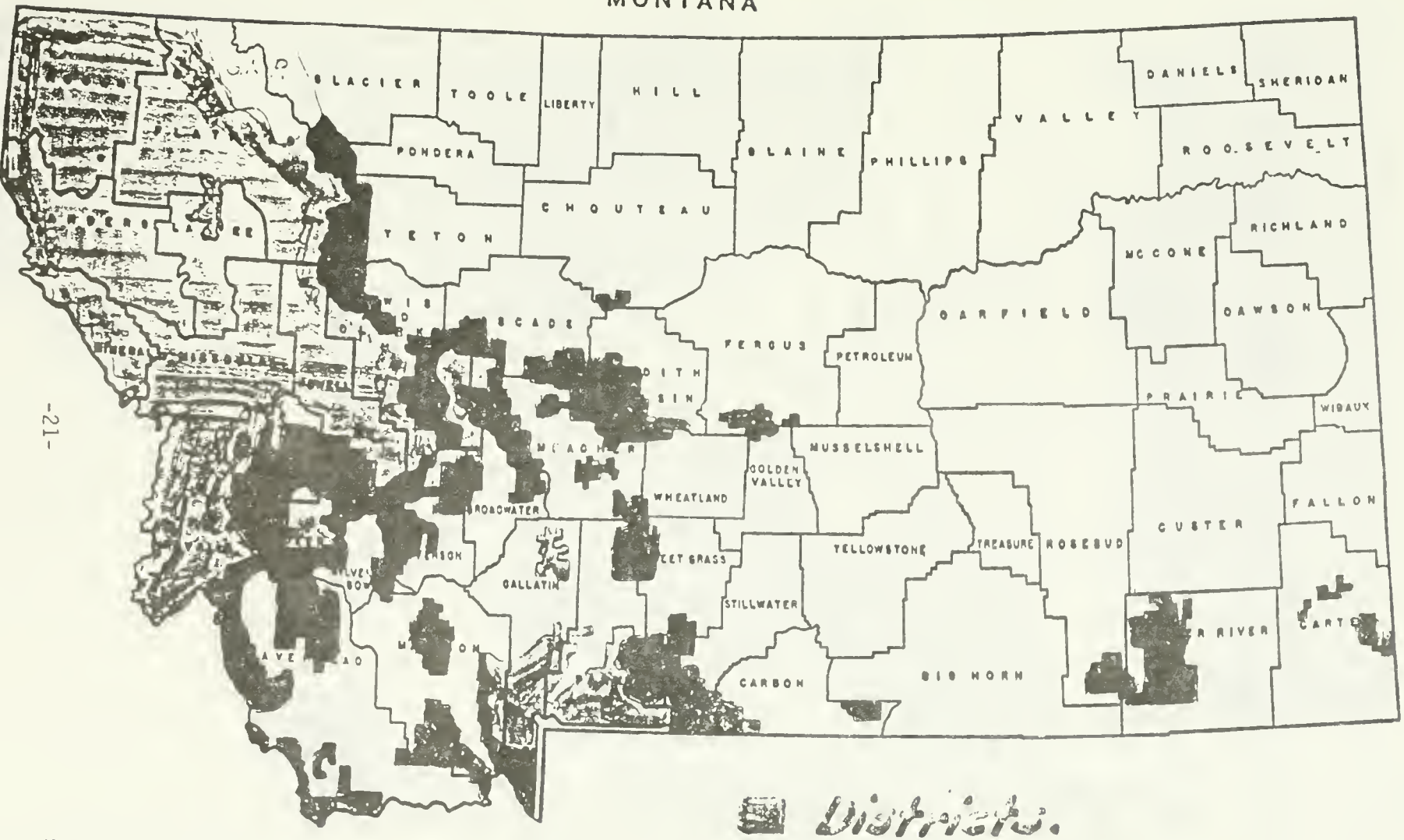
_____
Notary Public

Residing at _____

My Commission expires

_____

MONTANA



Districts.

Affidavit Units.

No. 1050 — County Outline Map
STATE PUBLISHING COMPANY
Helena
60 Pads - E - WY

ATTACHMENT #7

COOPERATIVE FIRE CONTROL AGREEMENT BETWEEN THE STATE OF MONTANA AND _____ COUNTY

THIS AGREEMENT is made and entered into by and between _____ County, hereinafter called the Cooperator, and the Montana Department of State Lands, Division of Forestry, hereinafter called the Department, and effective the _____ day of _____, 19____.

The purpose of this agreement, when signed by both parties and accompanied by a written wildland fire management plan, hereinafter called the plan, is to satisfy the requirements of 7-33-2210 MCA.

The parties to this agreement, in consideration of the mutual covenants and stipulations set out herein, agree as follows:

1. The Cooperator shall assist the Department in drafting and annually updating the plan for the fire protection area within the Cooperator's territorial boundaries.
2. The Cooperator shall appoint a county rural fire chief pursuant to 7-33-2203 MCA. The county rural fire chief shall work directly with the Department in accordance with the requirements of the plan.
3. The Cooperator shall annually appropriate funds as authorized by 7-33-2209 MCA. The Cooperator shall use the funds in accordance with the requirements of the plan.
4. The Cooperator shall implement the plan by performance of the duties imposed by 7-33-2202 and 7-33-2204 MCA, and by exercise of the powers authorized by 7-33-2205 through 7-33-2207 MCA.
5. The Department shall update the plan and present it for the approval of the Cooperator no later than May 15 of each year.
6. The Department shall, as funds permit, provide assistance to the Cooperator in accordance with the requirements of the Plan.
7. It is mutually agreed that both parties shall meet annually to review this agreement and the Plan. The Department shall schedule the annual meeting and shall notify all affected parties of the date and location of the meeting.
8. It is mutually agreed that this agreement may be terminated at any time by mutual consent of the parties. In the absence of mutual consent, either party may terminate this agreement on June 30 of any year by giving written notice to the other party on or before June 1 of that year. Unless terminated in accordance with this provision, this agreement will continue in full force and effect for an additional period of one year beginning July 1 of each year.

COUNTY OF _____

BY _____

BY _____

BY _____

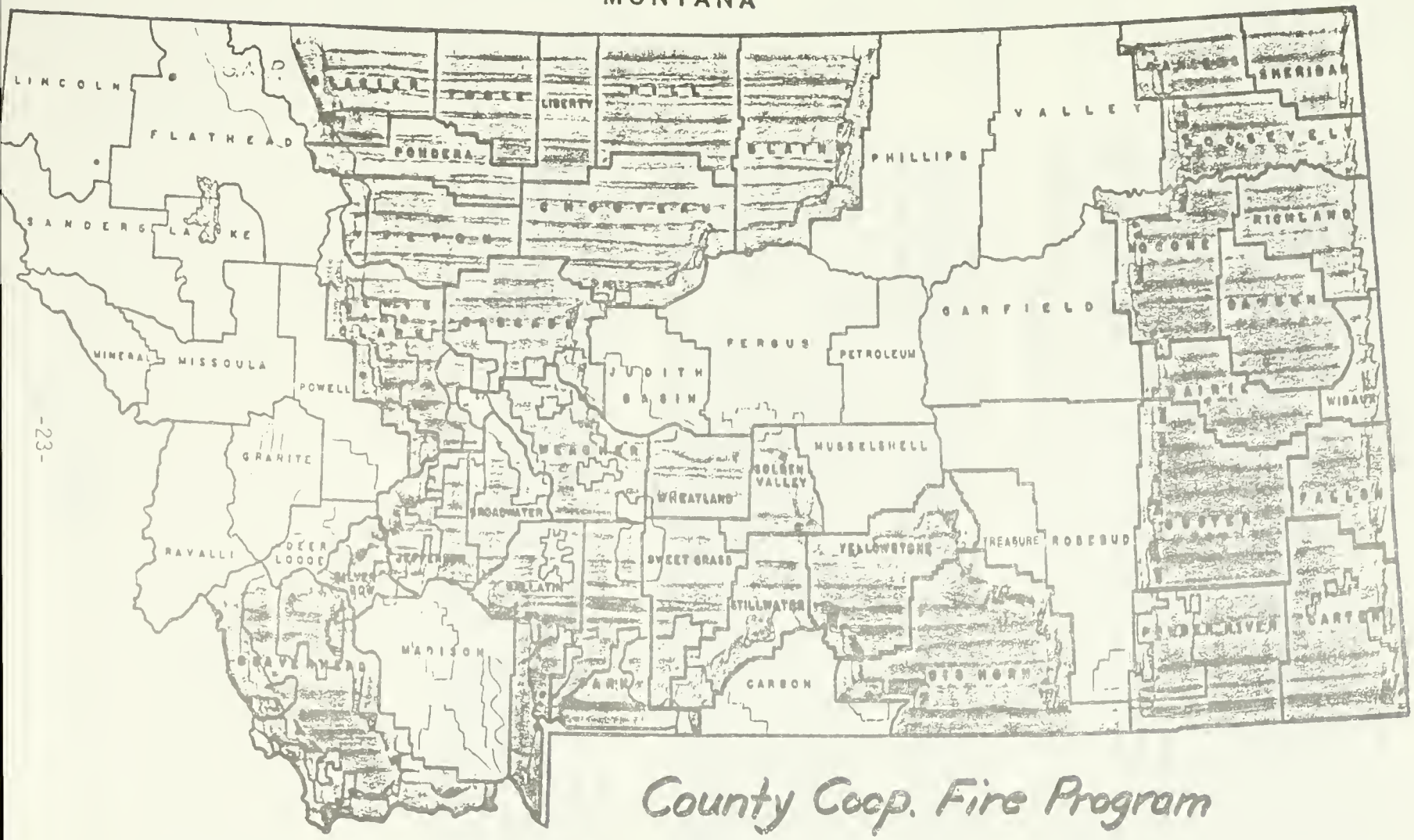
DEPARTMENT OF STATE LANDS

BY _____
COMMISSIONER

ATTEST:

_____
ADMINISTRATOR, DIVISION OF FORESTRY

MONTANA



County Coop. Fire Program

No. 1050 — County Outline Map
STATE PUBLISHING COMPANY
Helena
80 Pads - E - WY

76-13-201. Duty of owner to protect against fire. (1) An owner of forest land classified as such by the department shall protect against the starting or existence and suppress the spread of fire on that land. This protection and suppression shall be in conformity with reasonable rules and standards for adequate fire protection adopted by the board.

(2) If the owner does not provide for the protection and suppression, the department may provide it at a cost to the landowner of not more than 16 cents per acre per year and not less than $6 per owner per year in each protection district. The owner of the land shall pay to the county treasurer of the county in which the land is situated the charge for the same approved by the department in accordance with this part and part 1.

(3) No other charges may be assessed those landowners participating except in cases of proven negligence on the part of the landowner or his agent.

History: En. Sec. 9, Ch. 128, L. 1939; amd. Sec. 2, Ch. 141, L. 1941; amd. Sec. 1, Ch. 188, L. 1955; amd. Sec. 1, Ch. 91, L. 1959; amd. Sec. 1, Ch. 148, L. 1967; amd. Sec. 1, Ch. 252, L. 1974; amd. Sec. 6, Ch. 253, L. 1974; amd. Sec. 4, Ch. 397, L. 1977; R.C.M. 1947, 28-109.

76-13-108. Person responsible for performance of duties. (1) If the owner does not appear upon the public records as the holder of the legal title to the land or timber, he is nevertheless primarily responsible for the performance of the acts and duties imposed upon him by this part and part 2.

(2) Where the owner of the timber is not the owner of the land, the primary responsibility for the performance of the acts and duties imposed by this part and part 2 is upon the owner of the timber.

(3) Where the state has title to forest lands within any organized forest protection district, it shall be considered as an owner and it shall list its lands and pay the assessments to the recognized agencies responsible for lands in such organized forest protection districts.

History: (1), (2)En. Sec. 4, Ch. 128, L. 1939; amd. Sec. 3, Ch. 141, L. 1941; amd. Sec. 1, Ch. 94, L. 1959; amd. Sec. 3, Ch. 253, L. 1974; Sec. 28-104, R.C.M. 1947; (3)En. Sec. 8, Ch. 128, L. 1939; Sec. 28-108, R.C.M. 1947; R.C.M. 1947, 28-104(1), 28-108.

76-13-206. What constitutes compliance with duty to protect against fire for landowners within district. An owner of forest lands within an organized forest fire protection district while a member of or while participating in a recognized agency for forest protection or within areas protected by a county shall be considered to have fully complied with the requirements of 76-13-201.

History: En. Sec. 10, Ch. 128, L. 1939; amd. Sec. 1, Ch. 92, L. 1959; amd. Sec. 7, Ch. 253, L. 1974; amd. Sec. 5, Ch. 397, L. 1977, R.C.M. 1947, 28-110(1).

7-33-2201. Authority of county governing body to protect range, farm, and forest resources. For the purpose of protection and conservation of range, farm, and forest resources and of the prevention of soil erosion, the county governing body may perform the functions provided in this part.

History: En. Sec. 1, Ch. 173, L. 1945; amd. Sec. 12, Ch. 397, L. 1977; R.C.M. 1947, 28-601.

7-33-2101. Rural fire districts authorized — petition. The board of county commissioners is authorized to establish fire districts in any unincorporated territory or town upon presentation of a petition in writing signed by the owners of 50% or more of the area of the privately owned lands included within the proposed district who constitute a majority of the taxpayers who are freeholders of such area and whose names appear upon the last-completed assessment roll.

History: En. Sec. 3237, Pol. C. 1895; re-en. Sec. 2081, Rev. C. 1907; amd. Sec. 1, Ch. 16, L. 1915; amd. Sec. 1, Ch. 16, L. 1921; re-en. Sec. 5148, R.C.M. 1921; amd. Sec. 1, Ch. 15, L. 1931; re-en. Sec. 5148, R.C.M. 1935; amd. Sec. 1, Ch. 118, L. 1945; amd. Sec. 2, Ch. 97, L. 1947; amd. Sec. 1, Ch. 75, L. 1953; amd. Sec. 1, Ch. 75, L. 1957; amd. Sec. 1, Ch. 48, L. 1959; amd. Sec. 1, Ch. 77, L. 1959; amd. Sec. 1, Ch. 49, L. 1963; amd. Sec. 1, Ch. 45, L. 1969; amd. Sec. 2, Ch. 81, L. 1977; R.C.M. 1947, 11-2008(part).

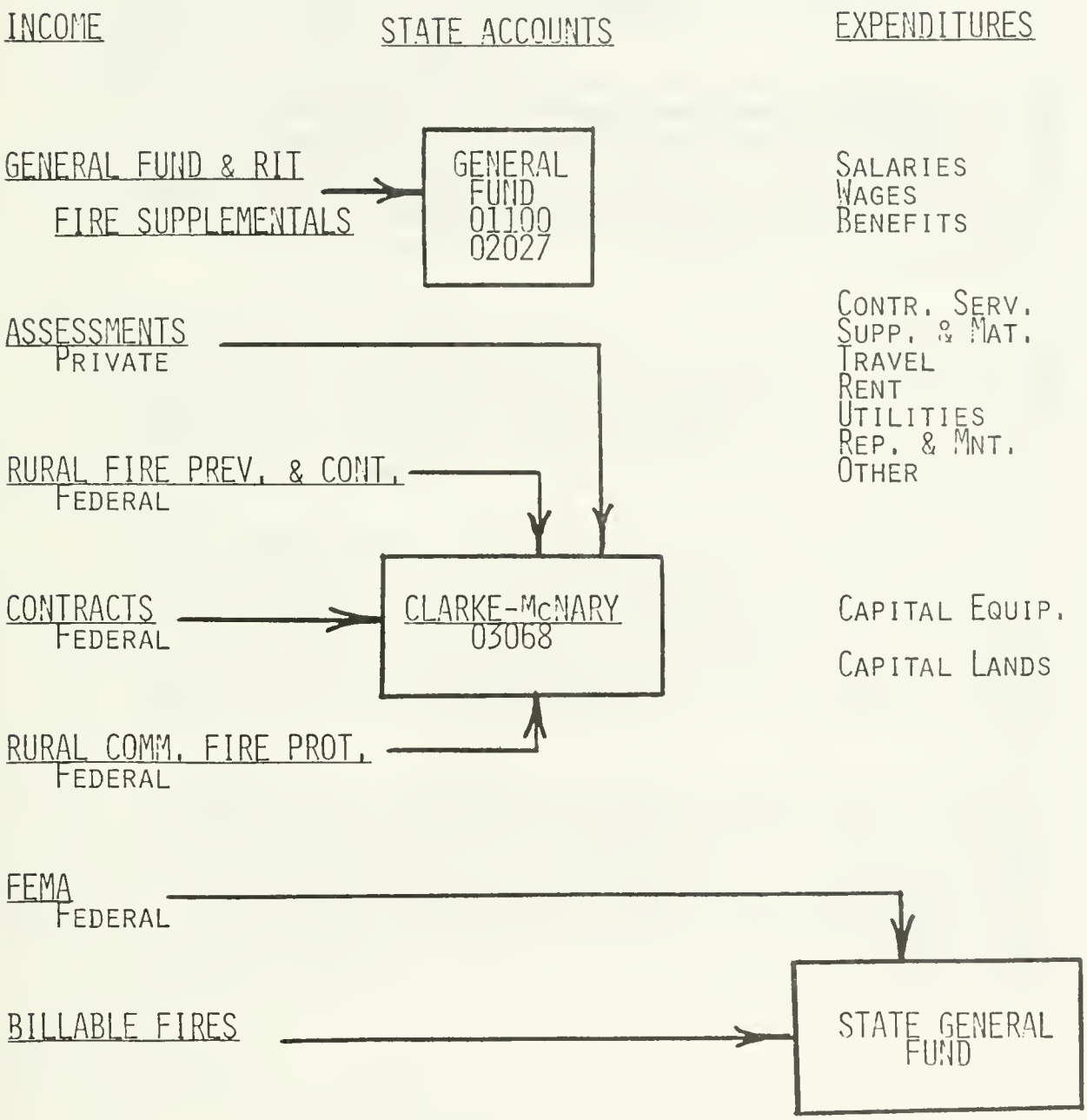
7-33-2311. Fire companies authorized. (1) Fire companies in unincorporated towns and villages are organized by filing with the county clerk of the county in which they are located a certificate in writing, signed by the foreman or presiding officer and secretary, setting forth the date of organization, name, officers, and roll of active and honorary members. The certificate and filing must be renewed annually on or before September 1.

(2) There must not be allowed to any such towns or villages more than one company for each 1,000 inhabitants, but one company must be allowed in any city, town, or village where the population is less than 1,000.

(3) There must not be allowed to any fire company more than 28 certificate members.

History: En. Sec. 3232, Pol. C. 1895; re-en. Sec. 2076, Rev. C. 1907; re-en. Sec. 5143, R.C.M. 1921; Cal. Pol. C. Sec. 3335; re-en. Sec. 5143, R.C.M. 1935; amd. Sec. 1, Ch. 69, L. 1977; R.C.M. 1947, 11-2003(part).

FIRE PROGRAM



ABSTRACT

This is a summary report on "A Study of the Cooperative Forest-Fire-Control Problem" for the Forest Service, U. S. Department of Agriculture. The principal objectives of this study were: (1) to determine the justifiable cost of protecting from fire state and privately owned forest and watershed lands, and (2) to develop criteria by which the respective shares of Federal, state, and private financing of forest-fire control on state and privately owned lands could be determined.

The justifiable annual cost of the Clarke-McNary cooperative fire-control program, including costs of fire prevention, presuppression, and suppression, was estimated to be about $60 million, based on timber losses alone. Although no numerical estimates are available, it is believed that an additional program expenditure of 25 to 35 per cent would be justified on the basis of damages to water resources and recreation.

The sharing of the costs of forest-fire control among private, state and Federal interests was based on two criteria: (1) responsibility for forest-fire risk, and (2) responsibility and interest in the various aspects of loss reduction. On the basis of these two criteria, it was estimated that the private share should be at least 16 per cent and the public share should be divided consistent with the following: 25 to 44 per cent state and 59 to 40 per cent Federal.

The state and private share, therefore, should be in the range of 41 to 60 per cent and the Federal share should be in the range of 59 to 40 per cent. These percentages were calculated using composite nationwide statistics. The principles used in estimating these over-all percentages are applicable to the further study of the equitable sharing of costs in any specific area. The national figures given in this study, however, cannot be applied directly to any area.

7-33-2209. Finance of fire control activities. (1) The county governing body is authorized to appropriate funds for the purchase, care, and maintenance of firefighting equipment or for the payment of wages in prevention, detection, and suppression of fires.

(2) If the general fund is budgeted to the full limit, the county governing body may, at any time fixed by law for levy and assessment of taxes, levy a tax at such rate as in their judgment will be necessary to raise such needed sum, not to exceed $15,000.

History: En. Sec. 3, Ch. 173, L. 1945; amd. Sec. 1, Ch. 40, L. 1955; amd. Sec. 1, Ch. 337, L. 1971; amd. Sec. 1, Ch. 73, L. 1977; amd. Sec. 14, Ch. 397, L. 1977; R.C.M. 1947, 28-603(5).

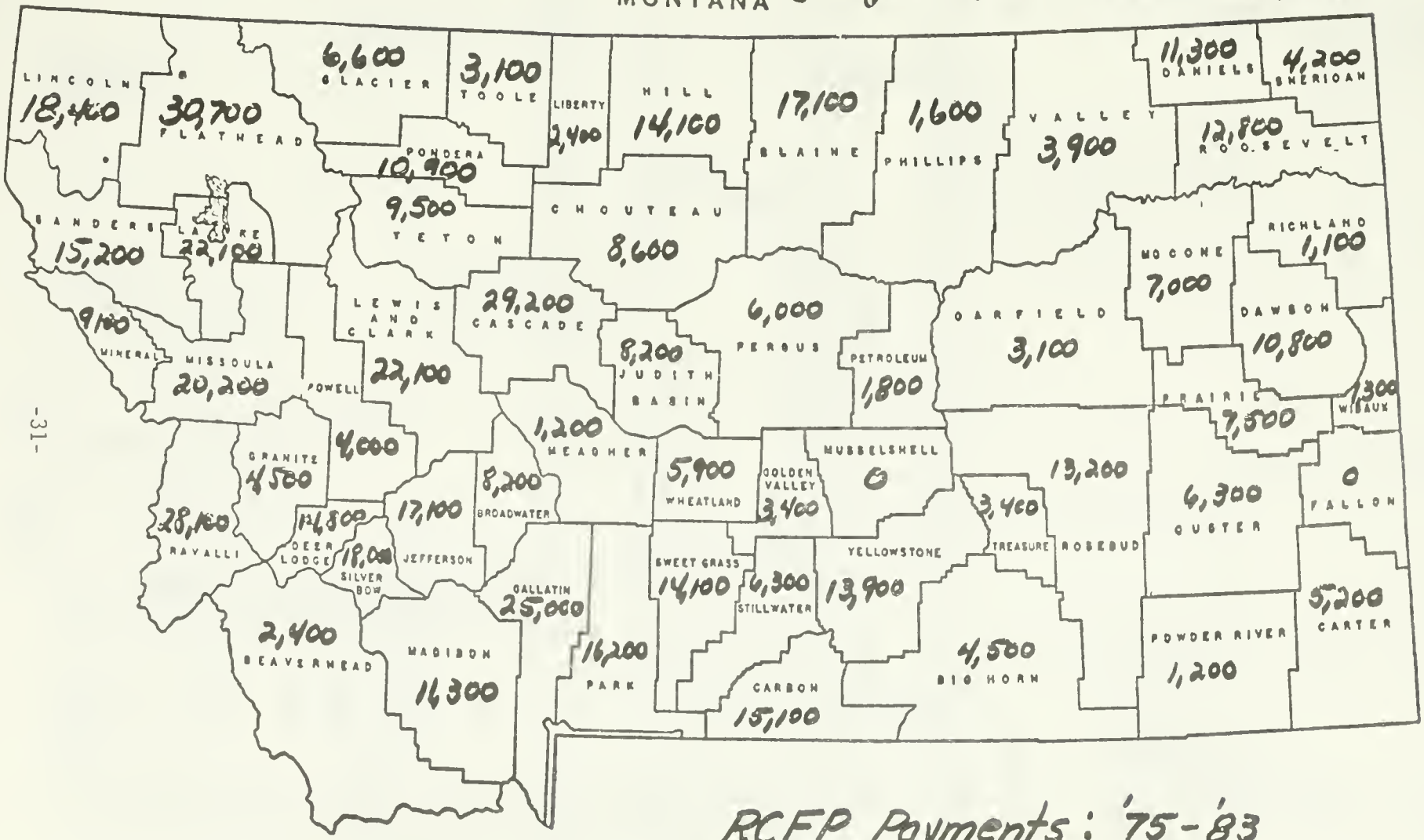
76-13-201. Duty of owner to protect against fire. (1) An owner of forest land classified as such by the department shall protect against the starting or existence and suppress the spread of fire on that land. This protection and suppression shall be in conformity with reasonable rules and standards for adequate fire protection adopted by the board.

(2) If the owner does not provide for the protection and suppression, the department may provide it at a cost to the landowner of not more than 16 cents per acre per year and not less than $6 per owner per year in each protection district. The owner of the land shall pay to the county treasurer of the county in which the land is situated the charge for the same approved by the department in accordance with this part and part 1.

(3) No other charges may be assessed those landowners participating except in cases of proven negligence on the part of the landowner or his agent.

History: En. Sec. 9, Ch. 128, L. 1939; amd. Sec. 2, Ch. 141, L. 1941; amd. Sec. 1, Ch. 188, L. 1955; amd. Sec. 1, Ch. 91, L. 1959; amd. Sec. 1, Ch. 148, L. 1967; amd. Sec. 1, Ch. 252, L. 1974; amd. Sec. 6, Ch. 253, L. 1974; amd. Sec. 4, Ch. 397, L. 1977; R.C.M. 1947, 28-109.

Rural Community Fire Protection Program. (Organize - Train - Equip.)



RCFP Payments: '75-'83
$560,000

No. 1050 — County Outline Map
STATE PUBLISHING COMPANY
Helena
80 Pads - E - WY

ATTACHMENT #16

ATTACHMENT #17

United States Department of Agriculture
Forest Service
P. O. Box 7669
Missoula, MT 59807

Reply to 5170

Date SEP 8 1982

Gary G. Brown, Administrator
Division of Forestry
Department of State Lands
2705 Spurgin Road
Missoula, Montana 59801

Dear Gary:

Al Troutt's letters to you dated January 22 and June 18, 1982, discuss the need to revise our cooperative fire protection agreement and established July 1, 1983, as the effective date.

We will charge the full cost of protection beginning July 1, 1983, or I could enter into an agreement for offset protection. It would not be practical to go to full offset protection in a short period of time due to impact on our organizations, lead time required for budgeting, planning, etc. We could mutually agree on an implementation plan, working toward full offset protection over a specific planning period.

The Forest Service protects over 2,200,000 acres of State and private land in Montana. The cost of protecting these lands is $.657 per acre (based on an average of the most recent 5-year costs) or a total of $1,445,000.

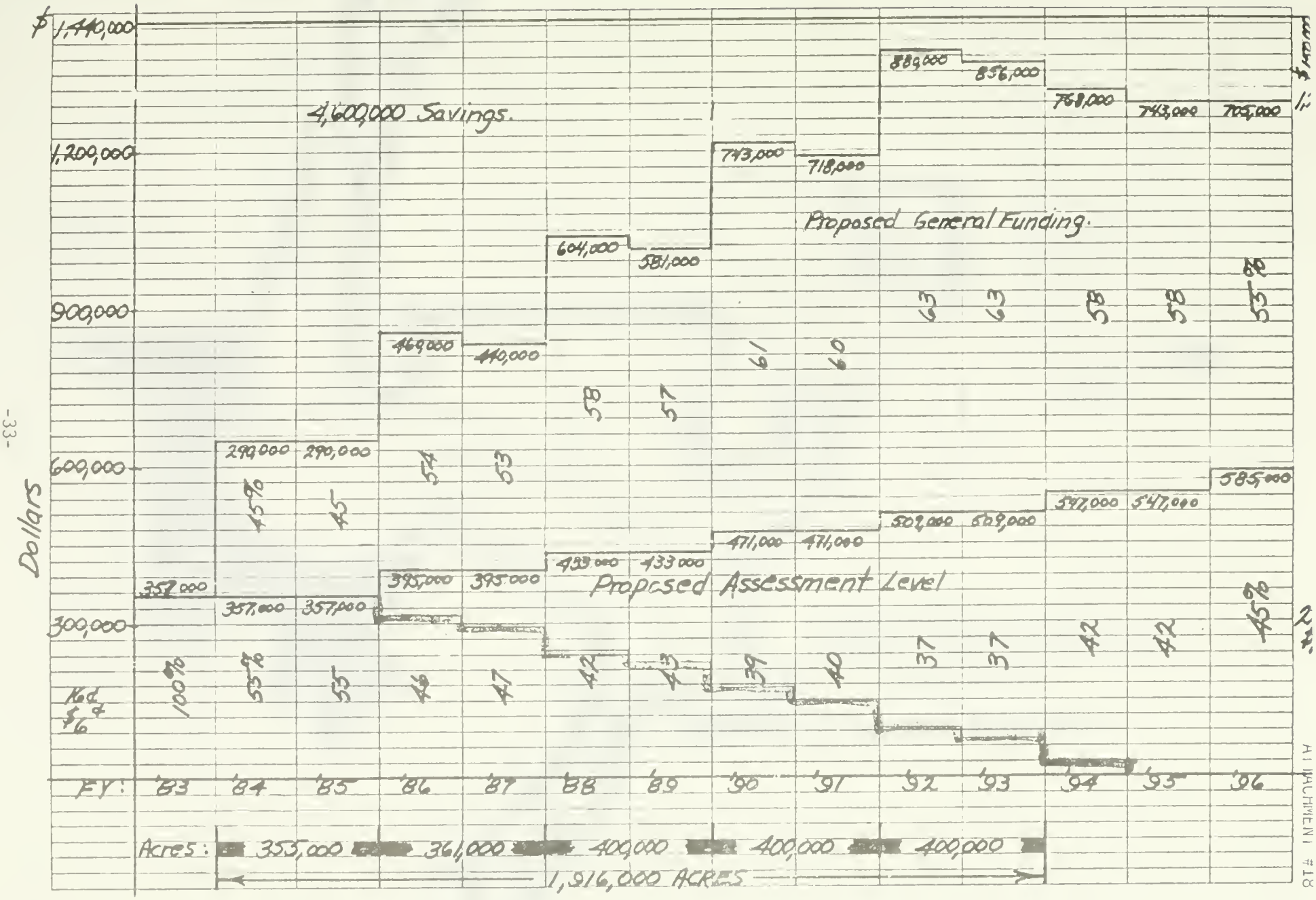
It is important that we continue a cooperative approach to fire protection in order to provide the most cost effective protection program. If you have any questions, please let me know. I would be glad to discuss this with you in more detail at your convenience.

Sincerely,

for TOM COSTON
Regional Forester

FS-6200-11(8-80)

Proposed Reduction in USFS Protection Contract.



ATTACHMENT #18

ATTACHMENT #19

APPENDIX E

ADDENDUM TO

COMPARISON OF THE COSTS TO ESTABLISH AND MAINTAIN STATE FOREST FIRE PROTECTION WITH THE COSTS TO CONTINUE CONTRACTING FOREST FIRE PROTECTION WITH THE U. S. FOREST SERVICE

Department of State Lands
July, 1984

INDEX

A. Rationale For Charging Landowners

1. Battelle Study
2. Past Compliance With 2/3-1/3 Ratio
3. Fire Incidence - Mancaused
4. Fire Incidence - Forest Landowners

B. Rationale For Charging The Minimum Fee Or Rate Per Acre

1. Assistance From Large Landowners
2. Increased Fire Activity - Small Ownerships
3. Values At Risk From Fire

C. Number of Landowners Paying Minimum Fee And Rate Per Acre

D. Percent Of Funding Via Assessments

A. Rationale For Charging Forest Landowners For Forest Fire Protection Services:

1. Battelle Study: The 1958 study by the Battelle Institute concluded: "The private share should be at least 16% and the public share should be divided consistantly with the following: 25 to 44% State and 59 to 40% Federal".

   This study has been the basis for the funding ratio of 2/3 State and federal funds and 1/3 private landowner assessments in past years. It was derived by using the Battelle figures of 32% State (mid-range of 25 to 44%) and 16% private. This is a 2/1 ratio of State to private.

2. Past Compliance with 2/3-1/3 Ratio:

Year	% Assessments
1974	26.7
1974-83	Average 30% *

3. Fire Incidence - Mancaused: Statistics for the number of fires over the past 18 years were analyzed. Railroad and other miscellaneous causes such as vehicle fires were deducted. Thirty-six percent (36%) of the remaining fires over the 18 year period were mancaused.

4. Fire Incidence - Forest Landowners: A further study of the fires in the years from 1977 through 1983 indicate that forest landowners or their agents ignited about 14% of all fires. These fires burned about 32% of the total acreage during that seven year period.

B. Rationale For Charging The Minimum Fee Or The Rate Per Acre:

Up until 1977 all forest landowners were charged a flat rate per acre. Most small landowners were not assessed since the rate collected many times did not cover the cost for postage to mail the assessment bill. A minimum fee was established in 1977 to correspond with the rate being charged in Idaho.

1. Assistance From Large Landowners: Large landowners regularly provide assistance in suppressing fires in addition to the assessment fee. This assistance includes manpower, equipment, detection of fires, road access, etc.

2. Increased Fire Activity - Small Ownerships: A study of 590 fires over a three year period indicate that 15% of all fires occurred on properties under 38 acres in size. The rate of fire incidence per acre on small ownerships was 140 times that on large ownerships. (See Table #1)

* Percent of annual operating budget without suppression supplemental

Table #1:

ASSESSMENT/ ACRES OWNED	1979 FIRE SEASON NUMBER OF FIRES	1979 FIRE SEASON PERCENT OF TOTAL	1982 FIRE SEASON NUMBER OF FIRES	1982 FIRE SEASON PERCENT OF TOTAL	1983 FIRE SEASON NUMBER OF FIRES	1983 FIRE SEASON PERCENT OF TOTAL	COMBINED NUMBER OF FIRES	COMBINED PERCENT OF TOTAL
1 - 38 ACRES	36	11.32%	21	17.95%	31	20.00%	88	14.92%
39 - 63 ACRES	9	2.83%	7	5.98%	4	2.58%	20	3.39%
64 - 94 ACRES	8	2.52%	5	4.27%	9	5.81%	22	3.73%
95 - 125 ACRES	9	2.83%	3	2.56%	1	0.65%	13	2.20%
126 - 156 ACRES	6	1.89%	1	0.85%	1	0.65%	8	1.36%
157 - 188 ACRES	6	1.89%	2	1.71%	4	2.58%	12	2.03%
189 - AND UP	244	76.73%	78	66.67%	105	67.74%	427	72.37%
TOTAL	318	100.00%	117	100.00%	155	100.00%	590	100.00%

3. Values At Risk From Fire:

Table #2:

Acres	Value/Acre	Current Assessment	Equitable Rate*
1	$ 4,527	$ 6.00	$ 90.00
20	83	6.00	33.00
38	45	6.00	34.00
80	20	12.50	32.00
140	13	22.40	36.00
180	9	28.00	31.00
500	7	80.00	70.00
640	9	102.00	115.00
1,000	8	160.00	160.00

* Calculated:

Acres x Value/Acre x .02 = Equitable Rate
.02 is the rate for assessment on the 1,000 acre parcel
Based on random samples in Flathead Co.

C. Number Of Landowners Paying Minimum Fee And Rate Per Acre:

Table #3:

Rate/ Acre	No. of Landowners	$ Collected	Min. Fee	Min. Acres	No. of Landowners	$ Collected	Total
16¢/Ac.	8,857	$643,972	$ 6	38	28,629	$171,774	$ 815,746
16¢/Ac.	3,866	603,764	$30	188	33,620	1,008,600	1,612,364

D. Percent Of Funding Via Assessments:

FYs	Total	State & Federal Funds	%	Private Assessments	%	Rate Per Acre	# Owners $ Collected	Min. Fee	# Owners $ Collected
'84	$3,137,633	$2,387,633	76	$ 750,000	24	16¢	8,857	$ 6	28,629
'86	3,303,633	2,493,633	76	810,000	24	16¢	8,857 640,000	$ 6	28,629 170,000
		2,387,633	72	916,000	28	16¢	6,800 638,000	$10	30,700 310,000
		2,312,543	70	991,000	30	16¢	6,200 636,000	$12	31,300 370,000
'88	3,469,546	2,636,546	76	833,000	24	16¢	8,300 642,000	$ 7	29,200 210,000
		2,387,633	69	1,081,913	31	16¢	5,400 632,000	$15	32,100 470,000
		2,312,543	67	1,157,003	33	16¢	4,800 628,000	$18	32,700 570,000
'90	3,635,459	2,762,949	76	872,510	24	16¢	7,250 639,000	$ 9	30,250 260,000
		2,387,633	66	1,247,826	34	16¢	4,700 624,000	$21	32,800 670,000
		2,312,543	64	1,322,916	36	16¢	4,400 621,000	$23	33,100 735,000
'92	3,801,372	2,889,043	76	912,329	24	16¢	6,800 638,000	$10	30,700 310,000
		2,387,633	63	1,413,739	37	16¢	4,250 617,000	$26	33,250 830,000
		2,312,543	61	1,488,829	39	16¢	4,100 615,000	$28	33,400 900,000

"MINIMUM" ACRES

COST PER ACRE IN CENTS	$6	$7	$8	$9	$10	$11	$12	$13	$14	$15	$16	$17	$18	$19	$20	$21	$22	$23	$24	$25	$26	$27	$28	$29	$30
$0.30	20	23	27	30	33	37	40	43	47	50	53	57	60	63	67	70	73	77	80	83	87	90	93	97	100
$0.29	21	24	28	31	34	38	41	45	48	52	55	59	62	66	69	72	76	79	83	86	90	93	97	100	103
$0.28	21	25	29	32	36	39	43	46	50	54	57	61	64	68	71	75	79	82	86	89	93	96	100	104	107
$0.27	22	26	30	33	37	41	44	48	52	56	59	63	67	70	74	78	81	85	89	93	96	100	104	107	111
$0.26	23	27	31	35	38	42	46	50	54	58	62	65	69	73	77	81	85	88	92	96	100	104	108	112	115
$0.25	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120
$0.24	25	29	33	38	42	46	50	54	58	63	67	71	75	79	83	88	92	96	100	104	108	113	117	121	125
$0.23	26	30	35	39	43	48	52	57	61	65	70	74	78	83	87	91	96	100	104	109	113	117	122	126	130
$0.22	27	32	36	41	45	50	55	59	64	68	73	77	82	86	91	95	100	105	109	114	118	123	127	132	136
$0.21	29	33	38	43	48	52	57	62	67	71	76	81	86	90	95	100	105	110	114	119	124	129	133	138	143
$0.20	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150
$0.19	32	37	42	47	53	58	63	68	74	79	84	89	95	100	105	111	116	121	126	132	137	142	147	153	158
$0.18	33	39	44	50	56	61	67	72	78	83	89	94	100	106	111	117	122	128	133	139	144	150	156	161	167
$0.17	35	41	47	53	59	65	71	76	82	88	94	100	106	112	118	124	129	135	141	147	153	159	165	171	176
$0.16	38	44	50	56	63	69	75	81	88	94	100	106	113	119	125	131	138	144	150	156	163	169	175	181	188

"MINIMUM" FEE IN DOLLARS

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